DOCUMENT RESUME

ED 147 126 SE 023 304

TITLE	National Environmental/Energy Workforce Assessment for Idaho.
INSTITUTION	National Field Research Center Inc., Iowa City, Iowa.
SPONS AGENCY	Environmental Protection Agency, Washington, D. C.
PUB DATE	77
GRANT	EPA-T-900591010
NOTE	109p.; For related documents, see SE 023 292-360; Contains occasional colored pages
EDRS PRICE	MF-$0.83 HC-$6.01 Plus Postage.
DESCRIPTORS	Air Pollution Control; *Career Opportunities; *Educational Programs; Energy; Environment; *Manpower Needs; Pesticides; *Pollution; Post Secondary Education; Radiation; *State Legislation; Water Pollution Control
IDENTIFIERS	*Idaho; Noise; Solid Wastes

ABSTRACT

This report presents existing workforce levels, training programs and career potentials and develops staffing level projections (1976-1982) based on available information for the State of Idaho. The study concerns itself with the environmental pollution control areas of air, noise, potable water, pesticides, radiation, solid waste, wastewater, and energy. The format includes workforce profiles, projections, growth and career options for each of the areas investigated. Additional sections of the report outline state legislation and selected post secondary institutions with formal Environmental/Energy programs. A state profile and summary is included for cross-reference. The selected bibliography is appended in the Region X report. This document is one in a series of 69 which presents information for each of the states, Washington, D.C., Puerto Rico, and the Virgin Islands, and national and regional summaries. (CS)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED147126

A National Environmental/Energy Workforce Assessment

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Conducted by:

National Field Research Center, Inc.

P.O. Box 287

Iowa City, Iowa 52240

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Donald Cook

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

SE 023 304

NATIONAL ENVIRONMENTAL/ENERGY

WORKFORCE ASSESSMENT

for

IDAHO

Conducted by:

NATIONAL FIELD RESEARCH CENTER, INC

Under Grant from:

UNITED STATES

ENVIRONMENTAL PROTECTION AGENCY

Grant #T900591010

1977

This document has been reviewed by the Environmental Protection Agency and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Environmental Protection Agency, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

National
Field
Research
Center, Inc.

Box 287 Iowa City, Iowa 52240 (319) 351-8788

INTRODUCTORY NOTE

The National Environmental/Energy Workforce Assessment was conducted by National Field Research Center, Inc. with main offices in Iowa City, Iowa. The following personnel have had primary responsibility for the Assessment and project report.

IOWA CITY, IOWA
Dr. Darold E. Albright, President
Paul E. Bridges, Executive Director
Dr. Richard L. Benesh, Project Director
Judith J. Gordon
Alan M. Stowell
Anita M. Stowell
Mary Kay (Edge) Wade

ATLANTA, GEORGIA
Elizabeth G. Nielsen, Regional Director
Robert Oxberger

DENVER, COLORADO
Nancy C. Dillenberg, Regional Director

SEATTLE, WASHINGTON
Steven Silva, Regional Director

WASHINGTON, D.C.
Frank E. Smith, Project Coordinator
Lloyd B. Chaisson, Assistant Project Coordinator
Jack F. Seum

Additional research and clerical assistance was provided by Frederick M. Wall, Maxine Wolfe, Margaret Fehn, Sandra Hogsed, Karen Kirchoff, Sharon Leiker, Marilyn Low, Mary McCormac, and Joan Urquhart.

FIELD OFFICES

ATLANTA
2700 Cumberland Pkwy
Suite 150
Atlanta, GA 30339
(404) 433-2644

DENVER
2600 S. Parker Rd.
Suite 160, No. 6
Denver, CO 80232
(303) 751-4962

SEATTLE
927 United Pacific Bldg.
1000 2nd Ave.
Seattle, WA 98101
(206) 623-9170

WASHINGTON, D.C.
1522 K Street, N.W.
Suite 600
Washington, D.C. 20005
(202) 223-9138

TABLE OF CONTENTS

	Page
ILLUSTRATIONS	iii
ACKNOWLEDGEMENT	v
PREFACE	vi
FOREWORD	vii
STATE SUMMARY	1
STATE PROFILE	14
POLLUTION CONTROL AND ABATEMENT AGENCIES	17
POLLUTION CONTROL AND ABATEMENT PROGRAMS	24
I. Air	25
II. Noise	31
III. Pesticides	33
IV. Potable Water	38
V. Radiation	51
VI. Solid Waste	56
VII. Wastewater	66
VIII. Energy	78
SELECTED POST SECONDARY INSTITUTIONS WITH FORMAL ENVIRONMENTAL/ENERGY PROGRAMS	85
STATE LEGISLATION	90

NOTE: The Selected Bibliography is appended to each Regional Report.

ILLUSTRATIONS

Figure		Page
1	Idaho Department of Health and Welfare, Division of Environment, Organizational Chart	19
2	Idaho Department of Health and Welfare, Division of Environment, Bureau of Water Quality	20
3	Idaho Department of Health and Welfare, Division of Environment, Bureau of Air Quality	21
4	Idaho Department of Health and Welfare, Division of Environment, Bureau of Environmental Health	22
5	Idaho Department of Health and Welfare, Division of Environment, Bureau of Regional Environmental Services	23
6	Future Fuels-Related Projects in Idaho	83

Table		Page
I	Idaho Department of Health and Welfare, Division of Environment, Bureau of Air Quality, Current (1976) Staffing Level	27
II	Idaho Department of Health and Welfare, Division of Environment, Bureau of Air Quality, Workforce Projections to 1982 (est.)	28
III	State of Idaho, Municipal Noise Ordinances (1975)	32
IV	Private Sector Pesticides Workforce, Current (1976) Staffing Level (est.)	34
V	Idaho Water Supply Systems (1973)	39
VI	Idaho Department of Health and Welfare, Division of Environment, Water Supply Program, Current (1976) Staffing Level	39

Table		Page
VII	Certified Water Treatment Plant Operators, Current (1976) Staffing Level (est.)	40
VIII	Idaho Department of Health and Welfare, Division of Environment, Water Supply Program, Workforce Projections to 1982 (est.)	42
IX	Certified Water Treatment Plant Operators, Workforce Projections to 1982 (est.)	43
X	Water Supply Training Systems and Participants Involved (1976)	49
XI	Idaho Department of Health and Welfare, Division of Environment, Bureau of Environmental Health, Radiation Control Section, Projected Program Activities to 1982	54
XII	Private Sector Solid Waste, Current (1976) Staffing Level (est.)	61
XIII	Private Sector Solid Waste, Workforce Projections to 1982 (est.)	63
XIV	Idaho Department of Health and Welfare, Division of Environment, Bureau of Water Quality, Waste Water Pollution Control, Current (1976) Staffing Level	68
XV	Certified Waste Water Treatment Plant Operators, Current (1976) Staffing Level	68
XVI	Idaho Department of Health and Welfare, Division of Environment, Bureau of Water Quality, Waste Water Pollution Control, Workforce Projections to 1982 (est.)	69
XVII	Certified Waste Water Treatment Plant Operators, Workforce Projections to 1982 (est.)	71
XVIII	Idaho State Office of Energy, Current (1976) Staffing Level	79
XIX	Future Electric Power Plants in Idaho	80
XX	Potential Geothermal Facilities in Idaho	81

ACKNOWLEDGEMENT

Appreciation is expressed to those who contributed their time and assistance to the success of this research project.

Included are the staff and administration of the Idaho Department of Health and Welfare, Division of Environment, under the direction of Dr. Lee W. Stokes. Also appreciated are the respondents to our many inquiries throughout Idaho's industrial and agricultural community.

Special thanks goes to Mr. Michael McMasters of the Department of Health and Welfare, Division of Environment, for the special insights contributed concerning the environmental education needs of Idaho. Of equal importance was the assistance of the following persons:

Mr. Michael Christie
Chief
Radiation Control Program

Mr. Ed Barker
Chief
Solid Waste Section

Mr. Murray Michael
Director
Air Programs

Mr. Al E. Murrey
Chief
Bureau of Water Quality

Mr. Alfred E. Miller
Supervisor
Pesticides Enforcement
Department of Agriculture

PREFACE

This report identifies existing workforce levels, training programs, career opportunities, and future staffing level projections (1976-1982), based on the information available for the State of Idaho in the environmental pollution control areas of air, noise, potable water, pesticides, radiation, solid waste, waste water, and energy. This study was carried out for the United States Environmental Protection Agency by National Field Research Center, Inc., of Iowa City, Iowa.

The information contained in this report was compiled through extensive on-site interviews with professionals working in the respective areas noted above and with telephone interviews and literature research in all areas.

FOREWORD

Information for this report was largely compiled from on-site interviews with professionals working in the various pollution control areas of air, noise, pesticides, potable water, radiation, solid waste, wastewater, and energy. For greater reliability, interviews were followed-up by telephone and mail contact to clarify and revalidate information.

It should be noted that all workforce projections are based on the professional judgement of those persons interviewed.

A review of existing legislation and pertinent program literature provided information concerning program priorities, goals, and objectives. This information was also helpful in identifying future career opportunities.

National Environmental Energy Workforce Assessment

Phase I

IDAHO

State Summary

I. AIR

The Idaho Department of Health and Welfare, Bureau of Air Quality, has primary responsibility for the formulation and implementation of state regulations concerning air pollution control. The five major components which outline the bureau's program are enforcement, surveillance, reporting, new source reviews, and emergency episode procedures.

The Bureau of Air Quality is presently staffed by 18 persons. Due to expansion in regulatory responsibilities and anticipated increased monitoring activities, Idaho expects to add 15 positions to its air program staff over the next five years. This growth will depend on mandates set forth by federal standards and the environmental attitude of Idaho's legislative body.

The industrial community, employing approximately 350 persons in air pollution control activities, has few air pollution problems of any magnitude. Thus, future workforce growth in this area is expected to be limited. The development of ambient lead standards, field burning control strategies, and minor source compliance orders are presently in the formative stage. To date, private sector workforce projections have yet to be established.

The bureau does offer some short-term training, such as smoke school and smog-reading school, but the bulk of agency staff training is done on-the-job.

Career potential in this field is primarily in degreed and graduate level positions such as a chemical engineer with a minor in public administration.

II. NOISE

The noise abatement and control program within the Department of Health and Welfare is a low priority program. If necessary, the department can establish and operate a noise abatement program as layed out in current state legislation. But, at the present time, no full-time regulatory program exists. However, the department does provide part-time assistance to noise pollution control activities.

Occupational noise problems can be enforced by Federal OSHA standards in the private sector and through the State Labor Department in the public sector. Law enforcement personnel and the State Labor Department personnel involved with OSHA standard enforcement represent the only workforce in this area. Specific workforce figures for noise abatement enforcement were not available.

Municipal noise control ordinances have been established in Boise, Idaho Falls, and Pocatello. The ordinances are enforced by local law enforcement authorities in response to complaints. Ordinances including acoustical criteria for vehicles are present in Idaho Falls and Pocatello only.

Consultant services are provided by various engineering and architectural firms as well as university professors. Sources in the field, however, cannot provide estimates of the number of persons engaged in consulting on noise control problems.

III. PESTICIDES

The Idaho Department of Agriculture, Pesticides Division is responsible for control and abatement of pesticide pollution. The department also provides for the registration of pesticides and the licensing of pesticide applicators, consultants, and dealers.

At present, the Department of Agriculture has five professional inspectors with degrees in areas of biology, botany, or entomology working in pesticide pollution control. The division expects to expand the current staff level by an additional five members to work in registration, licensing, and certification. Biology, botany, and pesticides will be the most applicable areas of study for the positions. The Toxic Substance Control Act of 1976 is expected to create additional need in areas of registration. Workforce activity projections have yet to be determined.

Training and certification of the private sector pesticides workforce is accomplished through the State Cooperative Extension Service. Current approximations of workforce licensing or certification include 350 owner/operators, 1,000 applicators, and 5,000 farmers totaling to 6,350 persons. Private workforce projections in these areas may include 16,569 persons assuming that approximately 10,000 farmers will find it beneficial to become licensed by the department. In addition to this number are approximately 900 licensed pest control consultants. The number of consultants is expected to increase by 300 in the next five years.

IV. POTABLE WATER

The principal agency resonsible for protection of public water supply is the Idaho Department of Health and Welfare, Division of Environment. This division currently employs a staff of thirteen professionals in the water supply program. To augment these water supply activities are district health department activities, which employ seven people. The professional disciplines of this combined workforce are sanitary and civil engineering, biology, chemistry, and public health. As a result of increased responsibilities mandated by the Safe Drinking Water Act, an estimated twenty more persons will be needed over the next five years at the public sector level to continue to administrate and coordinate the water supply program activities.

An estimated 350 water operators are involved in water supply according to professionals in the field. Of these, only 44 percent have been certified to date as certification is not yet mandatory. Based on the assumption that a mandatory program will be established within a five-year period, an estimated 310 additional water treatment operators will be needed by 1981.

Currently state and local agencies sponsor a voluntary certification program to promote the improvement and certify the ability of personnel employed in water facilities operation. Training courses designed to promote water operator certification are conducted through community colleges, seminars, and correspondence courses.

V. RADIATION

Regulatory responsibility for radiation control is vested in the Department of Health and Welfare, Radiation Control Section.

The section's staff of four professionals consists of three senior health physicists and one radiation specialist who performs supervisory functions. Projected program activities indicate a need for four additional persons to augment this staff in order to adequately handle the increased workload. These additional professionals will very likely be two senior health physicists, one radiation chemist, and one monitoring technician.

While comprehensive private sector workforce information was not available, estimates were based on ERDA Publication #78 entitled An Analysis of Nuclear Related Technician Manpower in Western States. A workforce of 93 radiation control technicians was stated as working in Idaho as of January 1, 1975 with a projected need for 37 additional technicians by 1977. The report indicated that both radiation control and monitoring technician positions show an increasing amount of excess demand projected for 1975-1977, resulting in a 33% shortage in 1977.

The Nuclear Regulatory Commission offers ERDA training seminars and courses to department employees. Training is also available through various universities and community colleges within the state. The department expects to provide educational programs to approximately 400 X-ray users regarding improved techniques for various examination activities in 1978.

VI. SOLID WASTE

The Idaho Department of Health and Welfare (IDHW), Division of Environment and the seven District Health Departments have been delegated the responsibilities in the solid waste management field. Three professionals currently staff the solid waste section, consisting of one engineer and two sanitarians. An increase of three positions is expected over the next five years, involving the addition of one engineer and two sanitarians.

At the municipal level, there are six sanitarians who provide assistance and support to the overall solid waste efforts through their respective districts. Because of future contracting of district health departments to perform field work, an estimated doubling of staff is expected within the next five years.

Private sector activity involving collection and disposal personnel have been estimated to involve 488 persons, with an estimated increase of 262 persons over the next five years due to more stringent enforcement of regulations and the increased volume of solid waste anticipated to be generated.

At the present time, training is conducted primarily on-the-job at disposal sites and collection systems. Future training involves developing awareness programs which will promote resource conservation and recycling efforts within the general public.

Planning and implementation of the Resource Conservation and Recovery Act of 1976 is expected to develop training activity within the private sector, however, specific programs have not yet been developed.

VII. WASTE WATER

The Idaho Department of Health and Welfare, Division of Environment, Bureau of Water Quality is the principal agency responsible for the control and abatement of waste water pollution.

As the regulatory body for waste water pollution control, the bureau conducts activities involving a professional workforce of 35 persons. These activities include compliance monitoring surveys, water quality assessments, treatment plant efficiency studies, waste water construction grants administration, and rules and regulation development. Fifteen additional professional positions are expected to develop over the next five years.

Private sector workforce activity is estimated to involve 326 waste water treatment plant operators at the present time. Workforce projection information indicates a probable increase in operator workforce levels to 646 by 1981.

More stringent enforcement of existing legislation and technological advances in the field of waste water treatment are going to create many jobs for treatment plant personnel in the next five years. These positions will include plant operators, maintenance personnel, and a basic labor force. It has been suggested by sources in the field that the proper training and certification of operator personnel may increase the efficiency of a treatment plant by 50 percent. This would indicate that operator training in the future will become an important component in the effort to eliminate waste water pollution in Idaho.

VIII. ENERGY

The Idaho State Office of Energy (ISOE) is the principal agency responsible for developing an effective state energy management plan. The current staff consists of nine professionals in positions of research analysts, public relations specialists, and scientists. If funding becomes available through the FEA, projects involving state conservation plan implementation and statewide auditing of industrial power consumption levels are expected to require the addition of five professional staff members. These positions will include two engineers and three field research specialists.

At the present time, no formalized training programs are operational in the ISOE. However, development of a public-oriented education program is being carried on in the office and is expected to be operational in the near future.

Plans are currently being implemented for future electric power-plants which will provide a great number of jobs during construction and also a number of jobs during actual operation. Geothermal energy, however, seems to be the greatest potential alternative energy form at the present time, with research being conducted at two locations in Idaho. If this becomes an energy fuel reality, highly trained specialists will be needed to develop and maintain pollution control systems specifically designed to control the particular pollutants inherent in geothermal production.

STATE OF IDAHO - SUMMARY

National Environmental/Energy Workforce Assessment
Pollution Control & Abatement Personnel
Projected Workforce Requirements (1976-1981)

Environmental Area	1976	1977	1978	1979	1980	1981	%/annum growth (average)
AIR[1]	18	25	28	30	32	33	14%
NOISE	0	0	0	0	0	0	0%
PESTICIDES[2]	5	6	7	8	9	10	15%
POTABLE WATER[3]	121	212	315	432	520	596	39%
RADIATION[4]	4	5	6	7	7	8	15%
SOLID WASTE[5]	500	563	632	692	722	759	9%
WASTEWATER[6]	361	420	482	558	626	696	14%
ENERGY[7]	9	10	11	12	13	14	9%
TOTALS	1,018	1,240	1,476	1,732	1,924	2,105	16%

[1]The above does not include 350 private sector positions, for which projections were not available.

[2]The above does not include 6,350 private sector positions, for which projections were not available.

[3]The above does not include water treatment operators in one specific category as projections by year were not available. A growth from 53 to 104 is expected in the next five years.

[4]The above does not include 93 private sector positions, for which projections were not available.

[5]The above does include both public and private sector positions.

[6]The above includes public and private sector positions.

[7]The above includes only state agency positions.

EDUCATION

Nearly all of the colleges and universities in Idaho have or are planning to offer courses or programs with an environmental emphasis. Three of the state's colleges offer a Bachelor's degree in some aspect of environmental science.

The College of Idaho, located in Caldwell, Idaho, awards a Bachelor's degree in Human Ecology. Boise State University offers an undergraduate program in Environmental Health. While the program provides the student with an extensive technical background in general sciences, it also introduces the student to overall environmental health administrative and legislative techniques.

The third state college offering an environmental science emphasis is Lewis and Clark State College. A Bachelor of Science degree in Social Science with an option in Environmental Science is offered.

Other colleges offering individual courses are Idaho State University, College of Southern Idaho, North Idaho College, and Ricks College. While Idaho State University offers two environmental courses, Environmental Technology and Environmental Health, a degree program is also available in Conservation. The College of Southern Idaho offers the course, Man and Environment while Ricks College has a select course in both Ecology and Field Ecology. The North Idaho College has a program in Social Ecology Resource Conservation.

Two college programs are detailed in the State Report: Boise State University and College of Idaho.

LEGISLATION

The environmental/energy legislation for Idaho was obtained by request from various agency personnel and through various library references. Summaries of the legislation deemed most relevant to the eight subject areas of the workforce assessment were prepared, and are included in the respective state reports. The following list of laws represents virtually all environmental legislation for the state. Only certain of the following laws were summarized; the list is presented to show, by title, the kinds of laws which have been enacted.

Environmental Protection and Health Act of 1972

Pesticide Use and Application Law

Pesticide Law

Local Planning Act of 1975

Solid Waste Law

National Environmental Energy Workforce Assessment

Phase I

IDAHO

State Report

STATE PROFILE

Idaho, one of the group of states known as Mountain States, is situated in the northwestern part of the United States, bordering on the Canadian province of British Columbia. It is roughly L-shaped, with the broad base of the "L" extending eastward to Wyoming. Along the northern border, Idaho measures only about 45 miles from east to west, whereas in the south it is 300 miles wide. From north to south along its border with Washington and Oregon, Idaho spans a distance of about 500 miles. In area, Idaho covers 83,557 square miles.

Idaho's unusual shape and great geographical diversity are the results, it is said, of its having been created from the leftovers of surrounding states. The mountainous and relatively moist northern section, known as the Panhandle because of its long, narrow shape, is heavily forested except for some farming areas in the rolling hills along the western border. Central Idaho for a north-south distance of some 200 miles is covered by a mountain wilderness as rugged and primitive as any to be found in the United States, with the possible exception of Alaska. Southern Idaho is a sagebrush desert except along the broad southward-dipping arc of the Snake River, where irrigation has turned fertile soils into an area producing a wide variety of crops and famous for potatoes.

The population of Idaho ranks among the lowest of the states. The preliminary 1975 figure from the U.S. Bureau of the Census states the

figure of 820,000 with a density of 9.9 per square mile. Almost 98% of the people are native-born Americans, but only somewhat more than half were born in Idaho. While the people in Idaho are overwhelmingly Caucasian, and Mormons are by far the largest religious group, the 1% of non-Caucasian residents include American Indian, most of whom live on reservations, and Japanese and Blacks.

Less than 1% of the population are Basques who live mostly in the Boise area. They are descendants of sheep-raising ancestors from the Pyrenees region of Spain and France.

The area south of the mountains along the Snake River is the most populous part of the state. About 70% of the population lives within 30 miles of that river. Irrigation projects along the Snake have brought the development of a string of centers for the marketing of farm produce, including from east to west, Idaho Falls, Blackfoot, Pocatello, Burley, Twin Falls, Boise, Nampa, and Caldwell.

Northern Idaho's most important industrial city, Lewiston, is located in a deep valley at the confluence of the Snake and Clearwater rivers. It is an inland seaport, barge traffic to the Pacific Ocean having been made possible by a system of dams on the lower Snake and Columbia rivers. Moscow, lying on a rolling plateau to the north, is a farm-marketing center for the fertile Palouse areas surrounding it.

In the upper Panhandle are many resort towns, the largest of which is Coeur d'Alene. This is also one of the chief centers of Idaho's logging and timber products industries. Kellogg, Wallace, and Mullan lie east of Coeur d'Alene in the heart of the lead-silver mining area.

Idaho traditionally has been an agricultural state, with forestry and mining helping to make up an annual per capital income somewhat below the national average. Since the 1940's, manufacturing has increased greatly. A more recent development is the realization that some of the leftovers bequeathed to Idaho from territorial days contain scenic and recreational resources of exceptional importance. By the late 1950's, tourism had moved ahead of mining as a producer of income.

Among Idaho's greatest assets are its rich agricultural lands, large tracts of which are as yet undeveloped, and the abundant water resources needed to bring them to productivity.

IDAHO POLLUTION CONTROL AND ABATEMENT AGENCIES

The Department of Health and Welfare, Division of Environment, constitutes Idaho's lead agency in pollution control regulation and abatement. This division currently employs 105 people with approximately $4,000,000 allocated in their FY 78 budget.

The duties of this agency include implementation, maintenance, and enforcement of state plans and regulations designed to maintain Idaho's compliance with national standards and regulations concerning pollution control in the various areas of air, noise, potable water, radiation, solid waste, and water quality.

Current priority projects include a strong effort in water supply to comply with the Safe Drinking Water Act of 1974. In addition, an increased effort is being given to the problems of solid waste disposal and resource recovery.

Current research projects being done by the Radiological Health Section include controlled filtration of X-ray equipment to decrease the radiation exposure to the public and continued monitoring of phosphate mining operations to decrease the radioactive waste hazard to the public.

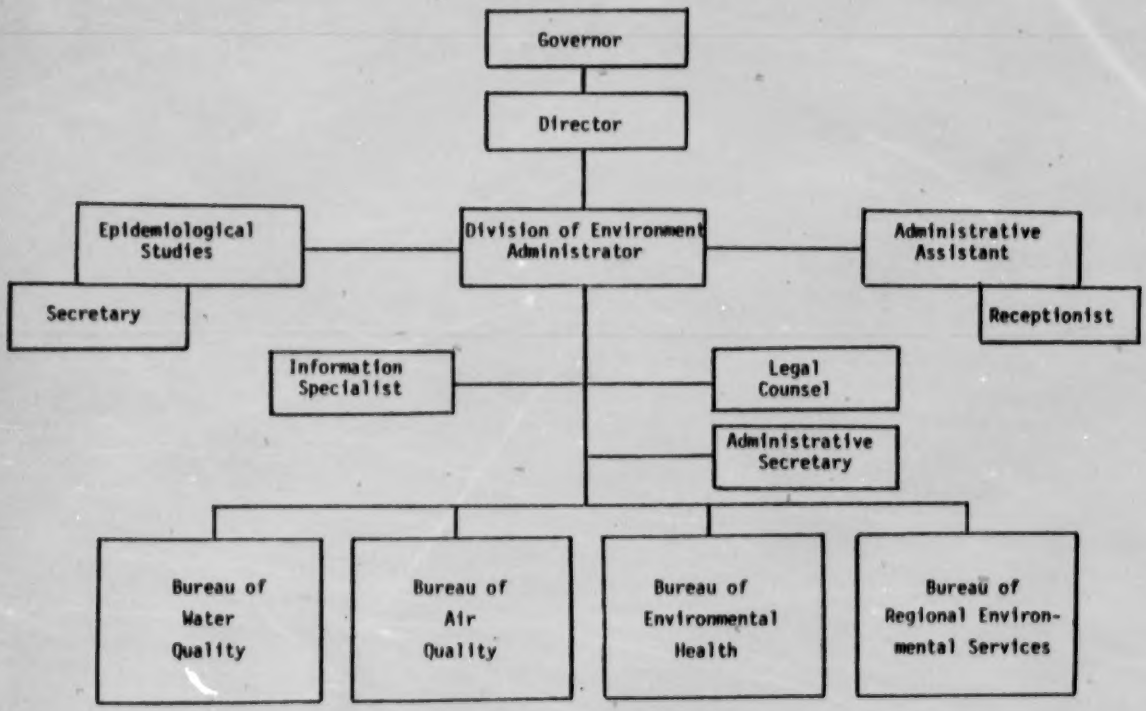
Additional state agencies concerned with environmental protection include the Idaho Department of Agriculture and the Idaho Public Utilities, Office of Energy.

The Department of Agriculture is responsible for the control and abatement of pesticide application through the licensing of pesticide applicators.

The Idaho Public Utilities, Office of Energy, constitutes the lead agency for the development and administration of energy policy.

Figure 1

IDAHO DEPARTMENT OF HEALTH AND WELFARE
Division of Environment



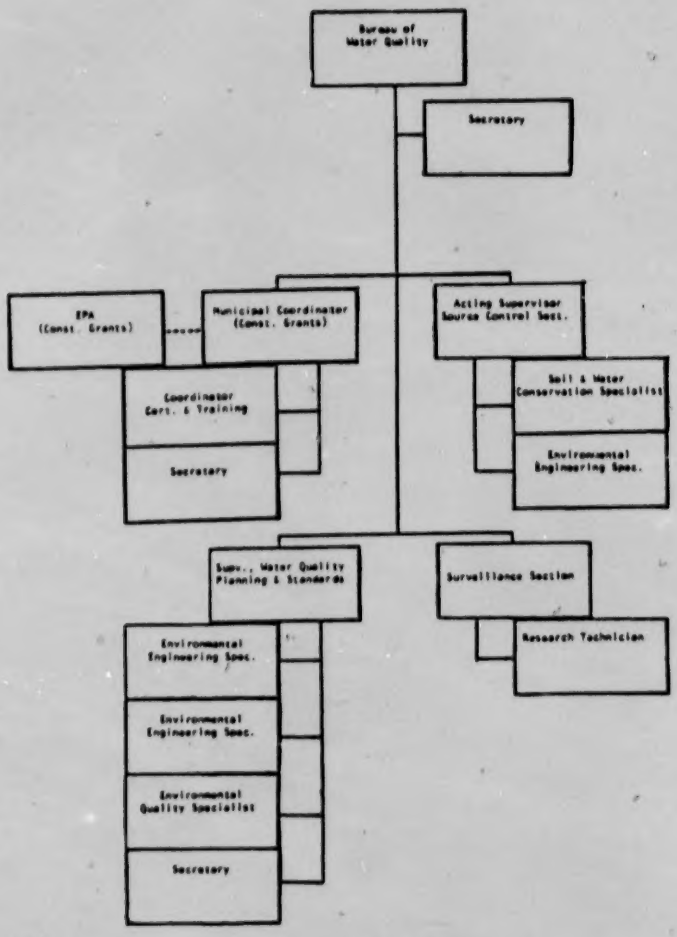
19

IDAHO DEPARTMENT OF HEALTH AND WELFARE

Division of Environment

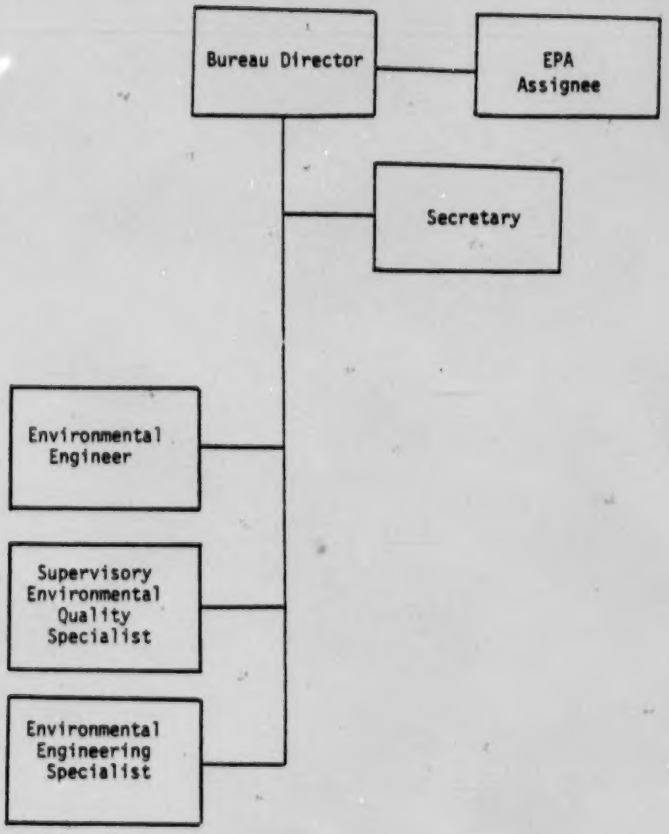
Bureau of Water Quality

Figure 2



IDAHO DEPARTMENT OF HEALTH AND WELFARE
Division of Environment
Bureau of Air Quality

Figure 3

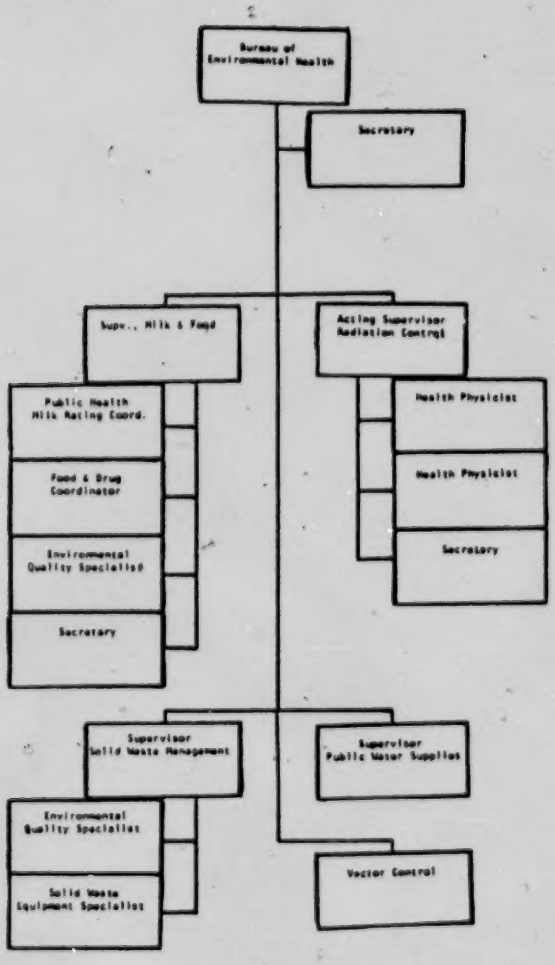


IDAHO DEPARTMENT OF HEALTH AND WELFARE

Division of Environment

Bureau of Environmental Health

Figure 4

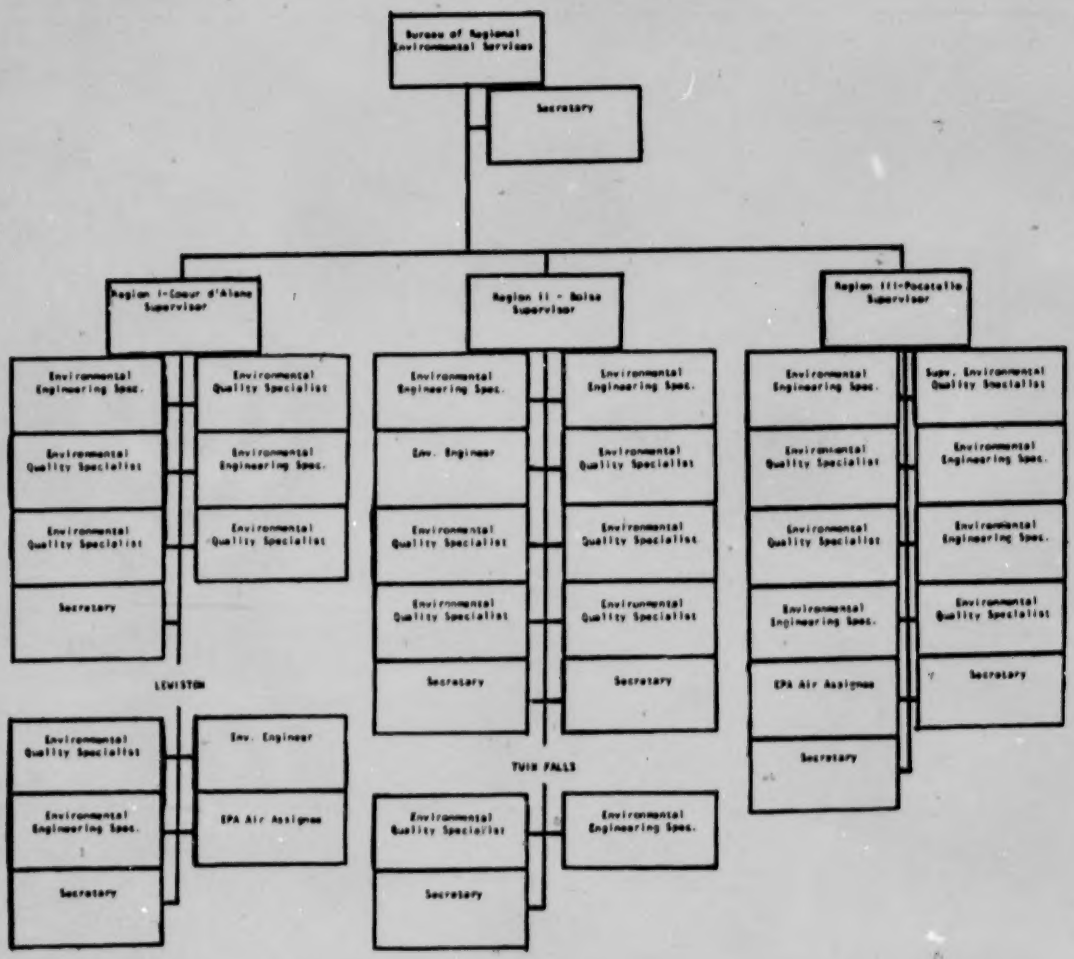


IDAHO DEPARTMENT OF HEALTH AND WELFARE

Division of Environment

Bureau of Regional Environmental Services

Figure 5



Pollution Control and Abatement Programs

I. AIR

A. Introduction

Today, within Idaho, the Idaho Department of Health and Welfare, Bureau of Air Quality, has primary responsibility for the formulation and implementation of state regulations concerning air pollution control. There are five major components which outline the bureau's program.

1) Enforcement - This activity can normally be handled by informing the violator of the problem and providing advice and information concerning the action required to remedy the problem. When violations are of a more serious nature, two general enforcement mechanisms are used.

   a. Administrative Compliance Orders (compliance schedules and permits)

   b. Formal Enforcement Actions (civil and criminal penalties, injunctions)

   The administrative procedures are generally preferred since the department resources involved in issuing a permit are substantially less than those involved in a suit; and progress towards achieving compliance will generally commence sooner with a permit.

2) Surveillance - In order to evaluate the effectiveness of control measures on source emissions and ambient air quality, it is necessary to operate an effective surveillance program. The surveillance program involves ambient air quality monitoring, inspection of point source, development of emission inventories, and source testing activities.

3) Reporting - State and federal requirements are such that reports are needed on a variety of program elements and activities. Reports required of the regional offices are as follows:

   a. Inspection Reports

b. Compliance Status

c. Compliance Certification Inspection Reports

d. Monitoring Reports

4) New Source Reviews - This activity involves the review of permit applications and the acceptance or denial of such applications.

5) Emergency Episode Procedures - These procedures are effective whenever air conditions are such that the National Weather Service declares a Special Dispersal Forecast and the bureau concludes that conditions are harmful to public health. Procedures include intensified monitoring activity, notification of episode to news media, point source curtailment, increased source inspection, and informing all involved when episode has been terminated.

Bureau priority projects in 1977 will include revision of state regulations, Air Quality Control Region evaluations, development of grass seed field burning control strategies, development of ambient lead standards, and determination of the carbon monoxide pollution extent and required corrective actions in Boise.

B. Workforce Profile

In order to meet the federal and state mandates relating to air quality control, the Department of Health and Welfare, Division of Environment, Bureau of Air Quality, presently has a staff of 18 persons. Although staff positions may vary somewhat, the following table represents an accurate workforce picture.

TABLE I

IDAHO DEPARTMENT OF HEALTH AND WELFARE

Division of Environment
Bureau of Air Quality
Current (1976) Staffing Level

Position	1976
Engineer	8
Scientist	5
Technician	3
Other	2
TOTAL	18

The position category "Other" contains one administrator and one attorney. These positions have responsibilities outside of the air program, but contribute a major portion of their time to this area.

Although the specific number of personnel working full-time on air pollution control in the private sector is a difficult number to identify, most of the major industries in Idaho have needed to assign a portion of their staff to monitor and regulate their discharge of air pollution to meet with state and federal air quality standards. According to sources in the field, there are approximately 100 major sources of air pollution in Idaho's industrial community which employ an estimated 350 persons working full- or part-time on air pollution control activities.

C. Workforce Projections

Workforce projections are based on the best professional judgement of persons involved in the state air program. Of particular assistance was Mr. Murray Michael, Chief, Bureau of Air Quality, Idaho Department of Health and Welfare (IDHW).

Over the next five years Idaho expects to increase its air program staff by 15 positions. This increase is the result of additional regulatory responsibilities and anticipated monitoring activities. Continued industrialization will develop additional permit and point source monitoring activities. The following table provides specific workforce projections by position title.

TABLE II

IDAHO DEPARTMENT OF HEALTH AND WELFARE

Division of Environment
Bureau of Air Quality
Workforce Projections to 1982 (est.)*

Position	1976	1977	1978	1979	1980	1981	%/annum turnover (average)	%/annum growth (average)
Engineer	8	9	10	11	12	13	11%	10%
Scientist	5	8	9	10	11	11	15%	19%
Technician	3	4	4	4	4	4	6%	7%
Meteorologist	0	1	1	1	1	1	20%	n/a
Other	2	3	4	4	4	4	12%	17%
TOTAL	18	25	28	30	32	33		14%

*All figures rounded to nearest whole number

The calculations used to determine the percent per annum growth and turnover rate averages were developed by calculating a by-year percent change, then totaling and averaging those numbers to give a five-year average figure. All subsequent figures will be calculated in the same way.

Within the public sector, a slow but continual growth is evident in Table II. This growth will not only depend on federal standards and the mandates set forth by those standards, but also upon the environmental attitude of Idaho's legislative body.

Recognizing that the private sector in Idaho has relatively few air pollution problems of any magnitude, future growth in this area is expected to be small. All workforce increases in this area will be dependent on forthcoming federal and state air pollution standards. The future development of ambient lead standards, field burning control strategies, and minor source compliance orders will all affect this area. Because the activities listed above are in the developmental stages, specific workforce projections were not available at this time.

D. Training and Certification

The Bureau of Air Quality does offer some short-term training, such as smoke school and smog-reading school, but they do the bulk of their agency staff training on-the-job. The upper level training is generally conducted at four-year and graduate level institutions. A need for more formal training in public administration has been identified in the air programs section.

E. Career Potential

From the information available, it appears that the professional field will be offering greatest opportunity. The positions will be primarily at the degreed or graduate levels in most situations. The chemical engineer with a minor in public administration will be best suited to fill administrative positions in the air pollution control agency. Technicians and engineering aides with two-year and vocational

technical training are expected to find career opportunities in the industrial workforce.

F. Conclusion

At the present time, the air pollution control field is staffed primarily by individuals with degrees in engineering, meteorology, and chemistry. These particular degrees are rarely designed to provide employment in air pollution control. Still, growth in this and related fields is anticipated, although many of those entering the field have not been specifically trained for emphasis in the environment by their institutions. Technical careers for those trained specifically in air pollution control will assuredly have a significant role to play in maintaining and in providing air quality in the future.

II. NOISE

A. Introduction

The noise abatement and control program within the Department of Health and Welfare is a low priority program. The department has enabling legislation to establish and operate an environmental noise abatement program if necessary. Motor vehicle noise problems are handled through law enforcement personnel. Occupational noise problems can be enforced by federal OSHA standards in the private business sector and through the State Labor Department in the public sector.

B. Workforce Profile

At the present time, IDHW provides part-time assistance to noise pollution control activities. It is the position of the office to handle noise pollution complaints as time permits and refer others to the necessary agencies when required. The law enforcement personnel and the state labor department personnel involved with OSHA standards enforcement represent the only workforce in this area. Specific workforce figures for this area were not available.

There are three cities in Idaho which have municipal noise control ordinances. They are Boise, Idaho Falls, and Pocatello. These ordinances are shown in the following table which is adapted from Sound and Vibration, September, 1975.

TABLE III

STATE OF IDAHO

Municipal Noise Ordinances (1975)

City	Nuisance	Zoning	Vehicle	Rec/ Vehicle	Rail- road	Air- craft	Con- struction	Build- ing
Boise	0	0	0	-	-	-	-	-
Idaho Falls	-	-	X	-	-	-	-	-
Pocatello	0	-	X	-	-	-	-	-

KEY: X regulations including acoustical criteria
0 regulations not including acoustical criteria
- no regulations

The ordinances are enforced by local law enforcement authorities in response to complaints. The omissions of acoustical criteria in the ordinances means that the regulations are nonquantitative and therefore difficult to enforce.

In addition, various engineering and architectural firms, as well as university professors occasionally work as consultants in the field of noise control. However, sources in the field cannot provide estimates of the number of persons engaged in consulting on noise control projects.

C. Conclusion

In conclusion, when and if noise pollution control becomes a problem large enough to necessitate an abatement program, the necessary legislation will be available, but the personnel to carry out the regulatory function may not be. This would indicate a need for training programs emphasizing noise pollution control in the areas of acoustics, acoustical engineering, physics, and architecture.

III. PESTICIDES

A. Introduction

The Idaho State Department of Agriculture (DOA), Pesticides Division, represents the state lead agency responsible for the control and abatement of pesticide pollution. The Director is authorized to adopt appropriate regulations for carrying out these responsibilities. Regulations have been developed for collecting and examining pesticide samples, safe handling, transporting, storing, displaying, distributing and disposing of pesticides and their containers, procedures in making pesticide recommendations, procedures for obtaining permits, and regulating the labeling of devices. In addition to the activities noted above, the department is actively involved in registration of pesticides and the licensing of pesticide applicators, consultants, and dealers.

The State Cooperative Extension Service provides training and information to dealers, applicators and farmers in preparation for licensing examinations. More detailed information concerning training activity will be provided in the training and certification section of this report.

B. Workforce Profile

Workforce information contained within this section was obtained through interviews conducted with professionals working in the Pesticides Division, DOA. Of particular assistance was Mr. Alfred E. Miller, Supervisor, Pesticides Enforcement, Idaho Department of Agriculture.

At the present time there are five professionals providing full-time workforce resource efforts in pesticides pollution control. These five professionals are considered inspectors and for the most part hold degrees in the areas of biology, botany, or entomology.

Sources in the field have indicated that three persons provide pesticides training efforts on a part-time basis through the State Cooperative Extension Service.

Private workforce activity involves the physical application and use of pesticides. In total, there are approximately 6,350 people who have been either licensed or certified to use restricted use pesticides. The following table lists these persons by categories.

TABLE IV

Private Sector Pesticides Workforce
Current (1976) Staffing Level (est.)

Workforce Activity	1976
Owner/Operator	350
Applicator	1,000
Farmer	5,000
TOTAL	6,350

Augmenting this workforce are approximately 900 licensed pest control consultants, many of whom are sales representatives for private manufacturerers.

C. Workforce Projections

The Department of Agriculture, Pesticides Division, has indicated that a probable increase of five persons over the next five years will

occur. These additional members will most likely provide assistance in registration, licensing, and certification. The necessary educational background will continue to be in the areas of biology, botany, and pesticides.

Workforce activity in response to the recent passage of the Toxic Substances Act of 1976 has yet to be determined. Sources in the field suggest that an additional registration workload may result from mandates set forth in the Act.

The department has indicated that approximately 33 percent of the owner/operators, applicators, and farmers have been licensed at the present time. In response to FIFRA requirements, the remaining 67 percent are expected to be licensed on or before October of 1977. This would indicate that the total private sector workforce in the next five years may include approximately 16,569 persons. This figure is based on the assumption that some 10,000 farmers will find it beneficial to become licensed by the department.

The number of pest control consultants is expected to increase by 300 in the next five years. This increase will be prompted by new pesticides entering the market and more stringent use and control standards affecting use activity. The total workforce in this area is expected to reach 1,200 by the year 1982.

D. Training and Certification

The DOA has developed a training program through the State Cooperative Extension Service. This program provides short-term training to

those persons who wish to obtain licenses. For the most part, private applicator training is conducted on a needs basis. When the number of persons desiring to be trained in a certain area warrants training activity, a short six-hour course is scheduled in that area and notification is made public of the availability of the course. In contrast, commercial applicator training is said to be more in-depth and requires advanced scheduling. At the present time, training programs of this form have involved a total of 5,523 persons.

E. Career Potential

Increases in the number of commercial applicators will provide career opportunities in years to come, however, because agricultural activity is very dependent upon climatic conditions, job security remains relatively low. Jobs on applicator crews are continually available because of the high rate of employee turnover. However, because of the seasonal nature of the job, the low pay, and lack of opportunities for advancement, such jobs do not offer particularly desirable long-term career choices.

Public sector career opportunities available in the future will involve hazardous waste disposal, pesticide inspection, and research activities in integrated pest management technology. These activities will require personnel who have acquired degrees in biology, botany, and entomology.

F. Conclusion

The continual development of more potent short-term pesticides has forced the development of more stringent control standards and

dramatically increased the responsibilities of regulatory agencies. Even with the many technological advances and the increasing use of integrated pest management practices, there seems to exist a continual need for upgrade training in both the public and private sector workforce. The provision of this training and the training of pesticide applicators may well be the most important task facing pesticide regulatory authorities at this time.

IV. POTABLE WATER

A. Introduction

The Idaho Department of Health and Welfare, Division of Environment, has in accordance with the provisions of Idaho statutes pertaining to the protection of domestic water supplies (Sections 37-2132, 54-1213, and 39-101, as amended Idaho Code), promulgated standards for chemical, physical and bacterial purity and standards for protection from impurities in water supplies. As the principle agency responsible for protection of public water supply, the division has been assigned powers and duties which require the establishment and enforcement of minimum sanitary standards for the collection, treatment and distribution of drinking water, including sanitary supervision, regulation and control of the construction, extension, operation and maintenance of public water supply, collection, treatment and distribution systems and approval of plans covering the construction and extension of such systems.

As indicated in the EPA report Idaho Water Supply Program Evaluation, 1973, in that year there were a total of 274 water supply systems serving a population of 481,899. State dental health records indicated that fourteen of the 274 public water supply systems in Idaho adjust the fluoride content of their water for dental health protection.

The following table identifies systems by population served.

TABLE V

Idaho Water Supply Systems (1973)

POPULATION GROUP	POPULATION SERVED	NUMBER OF SYSTEMS
Over 25,000	152,500	3
5,000 - 25,000	150,081	12
1,000 - 5,000	120,597	53
500 - 1,000	28,170	42
Under 500	30,551	164
TOTAL	481,899	274

B. Workforce Profile

The IDHW Division of Environment currently employs a total of 13 professionals in the water supply program. To complement water supply activities at the state level, seven professionals are actively involved within district health departments. The following table depicts the current public sector workforce by position title.

TABLE VI

IDAHO DEPARTMENT OF HEALTH AND WELFARE

Division of Environment
Water Supply Program
Current (1976) Staffing Level

Position	1976
Engineer	9
Biologist	3
Chemist	1
Sanitarian	7
TOTAL	20

The engineers listed in the preceding table are sanitary and civil engineers. It should be noted that the seven sanitarians are located in district health offices.

Because Idaho has yet to establish a mandatory certification program and has only a voluntary certification process, the number of water supply operators holding certificates is fewer than if certification were mandatory. Legislation which would promote mandatory certification is expected to be developed in the near future.

The following table illustrates the distribution of certified treatment plant operators by operator classification.

TABLE VII

CERTIFIED WATER TREATMENT PLANT OPERATORS
Current (1976) Staffing Level (est.)

Classification	1976
Class IS	53
Class IIS	19
Class IIIS	10
Class IVS	1
TOTAL	83
Class IF	3
Class IIF	9
Class IIIF	6
TOTAL	18

	1976
Certified Operators Working for Utility Serving a Municipality	24
Industrial Certified Water Operators	1
Water and Sewer District Certified Water Operators	3
Federal Facility Certified Water Operators	9
Other Certified Water Operators	16
TOTAL	53

In the preceding table, the notations of "F" and "S" indicate a facility activity. The "S" indicates wells and distribution systems while the "F" indicates filtration systems. The 53 operators in the lower portion of the table are operators working outside of municipal efforts. Classification levels were not available for this workforce.

Professionals in the field have indicated that a total of 350 water operators are currently involved in this area. This would indicate that approximately 44% of the operators in the field have been certified to date. Operators currently receive certification under guidelines established by the Water and Wastewater Operators Certification Board. Specific certification requirements will be provided in the training and certification section of this report.

C. Workforce Projections

Workforce projections are based on the best professional judgement of personnel at IDHW, Division of Environment (DOE). Of particular assistance was Mr. Howard Burkhardt, Chief, Bureau of Environmental Health, DOE.

At the present time 20 professionals administrate and coordinate water supply program activities at the public sector level. As a result of increased responsibilities mandated by the Safe Drinking Water Act of 1974, it is estimated that an additional twenty persons will be needed over the next five years. The increased responsibilities include development of water source inventories, water quality inspections and continued water chemical monitoring. The following table lists these projections to 1982 by professional position.

TABLE VIII

IDAHO DEPARTMENT OF HEALTH AND WELFARE

Division of Environment
Water Supply Program
Workforce Projections to 1982 (est.)

Position	1976	1977	1978	1979	1980	1981	%/annum turnover (average)	%/annum growth (average)
Engineer	9	11	14	17	18	19	20%	14%
Biologist	3	3	4	4	4	4	15%	5%
Chemist	1	1	2	2	3	3	15%	17%
Sanitarian	7	7	7	9	12	14	15%	13%
TOTAL	20	22	27	32	37	40		13%

It should be noted that engineers frequently use state agencies for testing grounds and often move on to more financially rewarding jobs in private industry after a short period of employment. This would provide reasoning for the high turnover rate of engineers.

As mentioned earlier, the sanitarians listed above are employed by district health offices in support of state water supply program efforts.

Projected increases in water treatment operators are based on the assumption that a mandatory certification program will be established within a five-year period. Projection information in this area was provided by Mr. Mike McMasters, Training and Certification, IDHW, DOE.

An estimated additional 310 water treatment operators will be needed over the next five years. The following table depicts these projections by operator certification level.

TABLE IX

CERTIFIED WATER TREATMENT PLANT OPERATORS
Workforce Projections to 1982 (est.)

Classification	1976	1977	1978	1979	1980	1981	%/annum turnover (average)	%/annum growth (average)
Class IS	53	105	170	234	275	310	25%	46%
Class IIS	19	38	54	80	110	127	20%	49%
Class IIIS	10	16	19	22	25	28	15%	24%
Class IVS	1	3	5	6	7	9	10%	66%
TOTAL	83	162	248	342	417	474		44%
Class IF	3	5	7	9	11	13	20%	35%
Class IIF	9	14	18	23	28	31	20%	29%
Class IIIF	6	9	15	26	32	38	20%	46%
TOTAL	18	28	40	58	71	82		36%

	1976	1981	%/annum turnover (average)
Certified Operators Working for Utility Serving a Municiplaity	24	48	15%
Industrial Certified Water Operators	1	3	10%
Water & Sewer District Certified Water Operators	3	9	15%
Federal Facility Certified Water Operators	9	16	15%
Other Certified Water Operators	16	28	20%
TOTAL	53	104	

It has been suggested by professionals in the field that operator certification promotes an upward mobility career attitude in most operators. Moreover, turnover rates diminish as certification levels increase.

Notation should be made concerning the dramatic increase over the next five years. This is due, in part, to the fact that many non-certified operators will become certified in the next five years.

D. Training and Certification

At the present time, a coalition of state and local agencies sponsors a voluntary certification program which has established specific requirements for certification classification levels. The agencies that co-sponsor this activity are as follows:

1) Idaho Department of Health and Welfare--Division of Environment
2) Association of Idaho Cities
3) Idaho Water and Wastewater Operators Certification Board
4) Pacific Northwest Pollution Control Association
5) American Water Works Association--Pacific Northwest Section--Intermountian Section

The purpose of the certification program is to promote the improvement and certify the ability of personnel employed in water facilities operation, thereby reducing the hazards to public health and protecting the water resources and the large investments made in water and waste water facilities in the State.

It is also the purpose of the program to provide a system by which personnel in the water fields may be examined and rated by qualified individuals in their own profession, thus establishing a standard of proficiency and public trust.

The suggested minimum job classifications for water system operators are as follows:

Water Systems Operator I

Nature of Work: Responsible for and in charge of the operation and maintenance of a Class I water supply system (Idaho Department of Health and Welfare classification) and for day-to-day delivery of safe, clear and sufficient water to the community. Performs related work as required. Maintains a constant check on efficiency of plant and system. Supervises work of subordinate employees. Exercises judgement and initiative.

Examples of Work: Operates and checks equipment, instruments, pumps, valves, etc. Takes readings of pressures, volumes, weights, levels and other data, and records it on log sheet. Lubricates, cleans and adjusts equipment. Keeps records of all phases of operation and maintenance. Collects, prepares samples and makes laboratory analyses. Directs and supervises laborers. Plans and schedules work.

Essential Knowledge, Abilities and Skills: Knowledge of operation, maintenance and repair of mechanical and electrical equipment. Ability to (1) check and detect flaws in operation of equipment; (2) make minor repairs to equipment; (3) use hand tools; (4) keep neat records and reports; (5) make routine tests; and (6) give clear and understandable instructions. Good physical condition.

Qualifications: High school graduate or its equivalent. Interest in sciences or mathematics. Ability to do simple arithmetic. Mechanical aptitude.

Desirable Training and Experience: Experience in operating and maintaining mechanical equipment, particularly at water systems. Supplemental courses in chemistry. Vocational school training.

Certification Requirements: Possession of a Class I (or higher) water supply systems operator's certificate or designation as a Class I operator-in-training from the Idaho Water Operators Certification Program.

Water Systems Operator II

Nature of Work: Responsible for and in charge of the operation and maintenance of a Class II water supply system (Idaho Department of Health and Welfare classification) and for day-to-day delivery of safe, clear, and sufficient water to the community. Performs related work as required. Maintains a constant check on efficiency of plant and system. Supervises work of subordinate employees. Exercises judgement and initiative.

Examples of Work: Operates and checks equipment, instruments, pumps, valves, meters, and other apparatus. Observes condition of raw water and makes or conducts and/or operates and backwashes filters. Makes daily inspection of mechanical and electrical operating condition of equipment, and records findings. Supervises general maintenance. Takes samples and makes laboratory analyses. Keeps log of plant or system operations. Calculates operating performance and cost. Keeps records and reports. Directs and supervises laborers. Plans and schedules work and assignments. Budget preparation.

Essential Knowledge, Abilities, and Skills: Knowledge of (1) principles, practices and methods of water treatment, storage and distribution; (2) operation of mechanical and electrical equipment; (3) occupational hazards and safety; (4) proper methods of lubricating, maintaining and adjusting equipment. Ability to (1) maintain, repair and adjust pumps, chemical feeders, instruments and other water systems equipment; (2) check operation of mechanical equipment, detect flaws and defects, and make corrections; (3) take accurate readings, keep routine records and make reports; and (4) plan, schedule and supervise work of subordinates. Advises municipal officials on present and future requirements to maintain safe and adequate water supply.

Qualifications: High school graduate or its equivalent. Knowledgeable in sciences and mathematics. Mechanical ability. Experience in mechanical and electrical equipment operation and maintenance. Knowledge of water chemistry.

Desirable Experience and Training: Experience in operating and maintaining equipment at a water system. Supplemental courses in electricity, water chemistry, physics.

Certification Requirements: Possession of a Class II (or higher) water supply systems operator's certificate from the Idaho Water Operators Certification Program.

Water Systems Operator III

Nature of Work: Responsible for and in charge of the operation and maintenance of a Class III water supply system (Idaho Department of Health and Welfare classification) and for day-to-day delivery of safe, clear and sufficient water to the community.. Supervises work of subordinate employees. Maintains a continuing check on efficiency of plant and systems. Performs related work as required. Exercises considerable judgement and initiative.

Examples of Work: Plans, schedules, assigns, and supervises work of subordinate operators, maintenance laborers, clerks and laborers. Supervises and participates in operation and maintenance of treatment plant and

distribution systems. Instructs operators about efficient operating methods. Plans and carries out maintenance of all kinds. Finds and corrects operating troubles; supervises repairs. Orders supplies, parts, and spare equipment. Budget preparation. Determines rate of flow for treatment to meet demand. Keeps necessary records. Makes special reports. Advises municipal officials on present and future requirements to maintain safe and adequate water supply.

Essential Knowledges, Abilities and Skills: Knowledge of (1) equipment, instruments, materials and operating practices for water treatment plants and distribution systems; (2) occupational hazards and safety; (3) water chemistry, bacteriology, laboratory techniques; (4) public health needs; (5) practices, methods, materials and tools of mechanical trades; and (6) methods of training and instructing employees. Ability to (1) analyze complex maintenance and repair needs; (2) supervise maintenance and repairs in plant and on system; (3) plan, layout and inspect work of personnel; (4) establish and maintain systems of cost accounting, bookkeeping, stockkeeping, and recordkeeping, and (5) supervise and handle personnel effectively. Skill in communications and public relations.

Qualifications: High school graduate and two-year AA degree or its equivalent. Knowledge and training in basic sciences. Extensive experience in plant operation and maintenance. Courses in water chemistry, electricity, bacteriology, laboratory techniques. Responsible charge of Class III plant.

Desirable Experience and Training: College level degree in science or engineering. Advance training in chemistry, physics, bacteriology, and management. Research and development methods and procedures. Business training with emphasis on economics and costs related to performance. Skill in speaking and writing, management, personnel handling, and public relations.

Certification Requirements: Possession of a Class III (or higher) water supply systems operator's certificate from the Idaho Water Operators Certification Program.

Water Systems Operator IV

Nature of Work: Responsible for and in charge of operation and maintenance of a Class IV water supply system (Idaho Department of Health and Welfare classification) and for day-to-day delivery of safe, clear and sufficient water to the community. Manages a relatively large organization. Business control. Policy determination. Financial and improvements planning. Public relations. Exercises judgement and initiative on a high level of responsibility.

Examples of Work: General supervision of plants and systems. Plan and recommend policies and budgets. Plan for expansion and improvement of plants and systems. General supervision of personnel. Supervises preparation of reports, records, accounts, requisitions, etc. Reviews operating performance and chemical, physical, and bacteriology analyses. Sponsors research and development. General supervision of training and safety programs. Contact with public officials. Public speaking. Policy-level conferences. Discipline of personnel.

Essential Knowledges, Abilities and Skills: Knowledge of (1) management practices; (2) budgeting; (3) municipal laws and regulations; (4) technical operation of water plants and systems; (5) public health standards; (6) personnel practices; (7) utility economics, service charges and rates, financing needs and limitations; (8) basic sanitary engineering. Ability to (1) investigate, plan and carry out improvement programs; (2) confer knowledgeably with technical operators on plant and system problems and needs; (3) organize and supervise activities of subordinate personnel effectively; (4) effect business controls and economics related to effective performance; (5) stimulate loyalty and enthusiasm of personnel; (6) write and speak persuasively; and (7) develop and carry out public relations programs.

Qualifications: College degree in science or engineering or equivalent training credits to meet college requirement. Broad experience in operation and maintenance of water supply systems. Special courses in chemistry, sanitary engineering, and management. Competency to work successfully within the governmental framework. Management ability.

Desirable Experience and Training: Research and development. Financial planning, rate structures, cost estimating, and operating costs related to performance. Business systems and procedures. Municipal and utility laws and regulations.

Certification Requirements: Possession of Class IV water systems certificate from the Idaho Water Operators Certification Program.

Training courses designed to promote water operator certification are operated through community colleges, seminars, and correspondence courses. Specific activity in 1976 involved the following training systems and participants.

TABLE X

Water Supply Training Systems
and Participants Involved (1976)

System	Number of Courses	Number of Students
Preparatory Courses	1	7
Seminars	1	100
Correspondence Courses	n/a	7

A traveling on-the-job program sponsored by DOE provides on-site upgrade training on a needs basis. Because of this needs basis, no specific numbers were available. In addition to the courses listed above, short courses are provided at community colleges when and where the need for this activity is identified. Information concerning the specific numbers would be considered speculative at this time.

E. Career Potential

Water supply activity in Idaho is expected to provide job opportunities for engineers, sanitarians and water supply operators. These positions will be available at state, local and private sector levels with responsibilities involving water use planning, water source inventory development and water quality monitoring. The majority of these activities have been in response to mandates set forth in the Safe Drinking Water Act of 1974 (SDWA). Future opportunities for chemists and laboratory technicians may well develop in response to increased bacteriological and chemical sampling required by the SDWA. Certified water treatment plant operators will be needed to bring about proper and effective use of existing treatment facilities to meet with more stringent enforcement of regulations. Training for personnel in the field of water

supply may be accomplished through university programs, vocational technical institutions and community colleges.

F. Conclusion

The foregoing suggests that a continued effort in planning and management will be necessary to provide an operationally efficient water supply program. One major factor necessary to maintain efficient water supply facilities is the proper education and training of water supply operators.

As a lack of qualified operators has been identified as a major workforce problem leading to the inadequate operation of treatment facilities, which in turn poses a threat to public health, efforts have been made to overcome this problem. The Water Operators Certification Board in cooperation with other agencies has developed materials and provided a rationale for developing mandatory certification legislation, yet certification legislation still remains voluntary. Their efforts of the past three years seems to have had little effect and as more regulations and stricter enforcement in the water area continues, hopefully certification will become mandatory.

V. RADIATION

A. Introduction

Regulatory responsibility for radiation control is vested in the Idaho Department of Health and Welfare, Radiation Control Section. The responsibilities of the Radiation Control Section are to license, register, advise and regulate all persons using radiation, radiation emitting machines and radioactive materials. Further, the Radiation Section has developed program goals which are designed to minimize exposure of the general population to unnecessary radiation from all controllable sources by:

1) Assuring that all statutory responsibilities relative to radiation protection are fulfilled,

2) Education of the user groups in the principles of radiation protection,

3) Surveillance of biological pathways for radioactivity entering the Idaho environment.

The current program objectives outlined by activity are provided as follows:

	FY 77 Original Projection
1. Inspections of licensed radiation-using facilities for regulatory compliance. (# of inspections)	400
2. Review of radioactive material license applications. (# of applications)	150
3. Biennial re-registration of X-ray-using facilities. (# of applications)	0
4. Review and revise radiation control regulations. (# of regulations)	0

	FY 77 Original Projection
5. Continue air and water surveillance relative to radioactivity entering environment from phosphate processing. (# of samples)	400
6. Continue routine, cooperative surveillance of INEL operations. (person-years)	1/4
7. Provide review/comment on radiation aspects of environmental impact statements. (# of EIS reviews/year)	4
8. Educational project for medical X-ray users regarding improved techniques for various examinations. (# of users)	400

B. Workforce Profile

Data for the workforce profile were obtained through on-site interviews with professionals in the field. Of particular assistance was Mr. Michael Christie, Chief, Radiation Control Program.

The Radiation Control Section maintains a current staff of 4 professionals. This staff consists of 3 senior health physicists and one radiation specialist who performs supervisory functions.

Comprehensive information regarding private sector workforce activity was not available. However, according to estimates provided by the Energy Research and Development Administration (ERDA) Publication #78 entitled An Analysis of Nuclear Related Technician Manpower in Western States, there were 93 radiation control technicians working in Idaho as of January 1, 1975. A radiation control technician is defined in the ERDA study as one who monitors personnel, plant facilities, work environment, and plant vicinity to detect and control radioactivity and/or radiation exposure and performs operation, analysis, and calibration or radiation monitoring equipment.

C. Workforce Projections

It has been indicated by professionals in the field that an additional 4 persons will be needed over the next five years to provide an adequate workforce for program activities. These professionals will consist of two senior health physicists, one radiation chemist and one monitoring technician.

The program activities requiring these additional workforce personnel are listed in table XI.

The previously cited ERDA publication reports that 37 additional radiation control technicians will be needed by 1977. Of these positions, 21 will represent the replacement of turnover, while only 16 new positions will be generated. The report also indicates that both radiation control and monitoring technician positions show an increasing amount of excess demand (inadequate supply) projected for the three-year forecast, resulting in a projected 33 percent shortage for 1977. It should also be noted that a large number of radiation control technicians in Idaho can be attributed to ERDA activities in Idaho Falls at the Idaho National Engineering Laboratory Site.

D. Training and Certification

IDHW employees receive training through ERDA seminars and courses offered by the Nuclear Regulatory Commission. Communication among professional staff members provides for a continuous exchange of state of the art knowledge and for new personnel represents on-the-job training potential.

TABLE XI

IDAHO DEPARTMENT OF HEALTH AND WELFARE

Division of Environment
Bureau of Environmental Health
Radiation Control Section
Projected Program Activities to 1982

	FY-78	FY-79	FY-80	FY-81	FY-82
1. Inspections of licensed radiation-using facilities for regulatory compliance (# of inspections)	200	250	250	250	250
2. Review of radioactive material license applications (# of applications)	150	150	160	170	180
3. Biennial re-registration of X-ray-using facilities (# of applications).	0	1,000	0	1,100	0
4. Air and water surveillance relative to radioactivity entering environment from phosphate processing (# of samples)	400	500	600	800	1,000
5. Continuation of routine, cooperative surveillance of INEL operations (# of person-years)	1/4	1/4	1/2	1	1
6. Continuation of educational projects for medical X-ray users regarding improved techniques for various examinations (# of users affected)	400	400	200	200	100
7. Develop and implement regulatory program relating to non-ionizing radiation sources (# of source inspections)	0	100	200	100	50
8. Implement radon-in-mines study (# of samples). . . .	0	300	100	50	50

Training is available through various Idaho universities for professional positions in radiation and through the community college system for technician level positions.

In 1978 Idaho Department of Health and Welfare, Radiation Control Section is expecting to provide educational programs to 400 X-ray users regarding improved techniques for various examination activities.

E. Career Potential

As dependence on nuclear power production increases, and research and development activity expands, many good career opportunities will be developed. Sources in the field have indicated that job opportunities will exist in abundance for highly trained engineers and health physicists as well as for technicians, maintenance, and labor personnel. Technological advances in X-ray use and methodologies are expected to provide career positions for health-related occupational personnel.

F. Conclusion

Radiation control and abatement has become a major concern to numerous public interest groups in the past five years. With increased public concern over radiation pollution and expanded use of radioactive materials in the medical and energy fields, a greater effort to regulate and monitor public exposure will be needed. This effort will be generated at the state regulatory level with the possible assistance of local and regional personnel. It would seem apparent that educational institutions will need to meet this demand by increasing the number of nuclear related programs available if qualified personnel are expected to be trained.

VI. SOLID WASTE

A. Introduction

Idaho's geographical characteristics, climatology, large land area, and small population create an unusual array of solid waste management problems. The relative abundance of remote undeveloped land surrounding population centers in conjunction with the antiquated solid waste management habits which have developed over the years is one of the most critical and difficult problems to solve. The severity of the problem varies from county to county ranging from indiscriminate dumping to total nonacceptance and rebellion against new improved solid waste management systems. There also exist the more conventional problems of properly locating and operating sanitary landfills and collection systems, with subsequent development of financing alternatives to cover increased costs.

The Idaho Department of Health and Welfare, Division of Environment and the seven District Health Departments have both been delegated responsibilities in the solid waste management field. DOE and the districts have been operating under the terms of a Memorandum of Understanding delineating certain specific functions for each of the agencies.

The terms of the Memorandum of Understanding are currently being investigated and a basic change may occur in the near future whereby DOE would contract with the districts for much of the field work in the solid waste management program. Regardless of the outcome of the investigation which is currently taking place, the basic goals and objectives

of the program and the method of achieving these goals and objectives will not change.

The program is designed with two primary functional activities of technical assistance and enforcement.

Technical Assistance Program - The principal objectives of this program are to develop solid waste management systems emphasizing acceptable disposal of the solid waste the state is currently generating. The procedure is to replace substandard open dumps with well-designed and operated sanitary landfills augmented by rural and municipal collection systems. Sanitary landfills are the most widely used means of disposal, primarily due to economic considerations.

The following procedure is normally followed when providing technical assistance to the counties or municipalities:

1) Make a survey of the existing solid waste management practices in the county including the location of disposal sites and solid waste collection routes in both the cities and towns and in the rural areas.

2) Locate an area or areas which would be suitable for the operation of a sanitary landfill. Items considered when searching for a suitable site are surface and ground water contamination potential, soil characteristics, location of the site in relation to population centers and transportation routes, and any factors which might affect the actual acquisition of the land.

3) Develop a recommended county solid waste management plan based on the unique characteristics of the county, including population and type of solid waste generated.

   Most plans emphasize the use of one (two in some instances) centrally located sanitary landfill augmented by a containerized collection system in rural areas and small towns with house-to-house collection in the larger cities and towns.

A cost estimate is then made for financing the total system, based on either a county-owned and operated system or a contracted operation.

Following the cost estimate, a financing scheme is then developed attempting to distribute the cost as equitably as possible to each county resident based on the service he or she is receiving.

4) Develop and assist the county in the implementation of a basic public information plan in order to minimize any adverse public reaction to the proposed solid waste management system.

5) Assist the county during the implementation of the solid waste management plan. This would include sanitary landfill operator training, preparing bid and contract specifications, and troubleshooting the collection routes.

6) Establish a continued surveillance and inspection program of the solid waste management system, including sanitary landfill inspections and collection route surveillance.

7) Provide assistance when needed to solve operational problems evident with the solid waste management system and improve the system as required, or to reflect any technological improvements in the solid waste management field.

Enforcement Program - Since DOE cannot legally provide technical assistance to private individuals or companies, there are two basic strategies to initiate improvements if enforcement is required. One is used for counties and municipalities if the technical assistance program is not successful and another is used for private individuals or companies. An outline of the chronological steps for each enforcement strategy is listed below.

1) Initial documentation of the solid waste problem and notification of the responsible party. (Following this, if it pertains to a county or municipality, the technical assistance program is initiated.)

2) Following the initial notification as referred to under Item 1, and after the technical assistance program (if applicable) the enforcement procedure is the same for counties and municipalities as it is for private individuals or companies.

   If the solid waste problem was not corrected, a follow-up letter is sent by certified mail referring to the original notification and restating the problem with a time limitation for correcting the problem. An extension of time can be granted for correction of the problem if deemed reasonable.

3) If the problem has not been corrected in the allotted amount of time, the responsible party is notified by certified mail that a formal board hearing has been scheduled in the case of counties or municipalities or that a formal complaint has been filed with the appropriate legal authorities if the case pertains to private individuals or companies.

4) If the problem has not been solved by any of the above steps, litigation is then initiated.

In addition to the short-range management strategy, the department has developed a set of long-range objectives which may be capsulized as follows:

1) Provide technical assistance to the local voluntary recycling centers to help expand their working volume and area. Also assist in the development of these recycling centers for cities and other areas without such a service. Provide publicity to make people aware that such a service exists in their area, and to promote more comprehensive "source separation" recycling of this type. Also assist the communities in developing local ordinances promoting source separation.

2) Develop and sponsor and/or support legislation promoting source reduction, reuse, and recycling in that order of priority. Since much of this type of legislation would work more realistically at the national level, this direction will also be pursued as much as possible. As part of the source reduction program, the department

intends to support high minimum standards for consumer goods including such items as appliances, furniture, furnishings, tires, and home construction standards, and will encourage higher taxation of single service items.

In addition to the more conventional type of solid waste referred to in the preceding pages, there are specialized types of solid waste which will require special programs. The following lists this special waste program strategies.

1) Continue with the development of the hazardous waste management program. Since a hazardous waste survey has been completed, the primary components are known and this is where the emphasis will be placed.

   a) Pesticides and related wastes including empty containers comprise over 95% of Idaho's hazardous waste. One state-approved privately operated hazardous waste disposal site now exists near Grandview, Idaho. This is operated by Wes-Con, Inc. The site has been approved for pesticides and related wastes. Other types of material require specific approval by DOE.

   b) Work is currently under way and increasing emphasis will be placed on locating, investigating, and approving certain existing sanitary landfills for the disposal of triple rinsed pesticide containers. The sites will be regionally located if soil conditions, depth to water table, precipitation rates, operational techniques, and other factors will allow.

   c) Perform surveys of pesticide users to determine disposal practices and initiate the required improvements. The large users will be approached first including commercial applicators.

   d) Perform surveys of hazardous types of hospital wastes and further investigate certain types of industrial and commercial hazardous waste.

2) Assist the counties and cities in developing solid waste management programs for automobile hulks, dead animals (primarily

livestock), and sewage sludges and septic tank pumpings. A survey of sewage sludge disposal practices will also be undertaken.

3) Investigate current management practices for certain types of industrial and agricultural wastes such as whey, manure, and certain types of crop wastes.

In summary, the basic solid waste management strategy is to improve conventional solid waste management practices first with increased emphasis placed on resource conservation programs and special wastes when acceptable conventional solid waste management systems have been established.

B. Workforce Profile

The Solid Waste Management Section of IDHW currently is staffed by three professionals. This staff is comprised of one engineer and two sanitarians. Their duties involve the state-wide planning and management of solid waste collection and disposal systems. In addition to the personnel at DOE, there are six sanitarians employed at the district health department level. These persons provide assistance and support to the overall solid waste management efforts through their respective districts.

Private sector workforce activity in the areas of solid waste collection and disposal are depicted in the following table.

TABLE XII

PRIVATE SECTOR
Solid Waste
Current (1976) Staffing Level (est.)

	1976
Collection	400
Disposal	88
TOTAL	488

At the present time, few efforts are being made in Idaho toward resource recovery. Recycling of fractions of the waste load has occurred in the past, but is constantly losing ground because of labor, economic and quality control aspects of society. The combinations of labor cost to separate and prepare the product, increasing demands for purity of the salvaged product so as not to contaminate the new product, decreased reliance on the salvage as raw material by industry, and decreases in the prices of the salvaged materials have led to decreased interest and, in some places, complete abandonment of recycling efforts. New and improved methods that are economically feasible have not been developed to keep up with the waste load.

C. Workforce Projections

Workforce projections were obtained through interviews conducted with professionals working in the solid waste management field. Of particular assistance was Mr. Ed Barker, Chief, Solid Waste Section, IDHW.

Because of more stringent enforcement of regulations and increased attention to the management of hazardous wastes, IDHW expects to increase its professional staffing level in this area by three positions within the next five years. These positions will involve one additional engineer and two additional sanitarians.

Sources have indicated that future contracting of district health departments to perform field work in solid waste management will necessitate an increase in professional staffing levels. It has been estimated that six additional sanitarians will be added to complement current staffing levels

in the next five years.

As more stringent enforcement of solid waste collection and disposal regulations occurs in conjunction with increased volume of solid waste generated, the private sector workforce is expected to increase by an estimated 262 persons over the next five years. Table XIII illustrates the projected increases to 1982.

TABLE XIII

PRIVATE SECTOR
Solid Waste
Workforce Projections to 1982 (est.)

	1976	1977	1978	1979	1980	1981	%/annum turnover (average)	%/annum growth (average)
Collection	400	450	500	550	575	600	20%	8%
Disposal	88	110	130	140	145	150	25%	12%
TOTAL	488	560	630	690	720	750		9%

Turnover rates are generally high in this area due to frequent injuries, low pay, and the unskilled nature of the jobs which allows little opportunity for advancement.

D. Training and Certification

At the present time, training in the solid waste field is conducted primarily through on-the-job training at disposal sites and collection systems. It has been suggested that additional training in specialized areas such as hazardous wastes, pesticide disposal, and resource recovery will become an important priority in the near future.

As a major component of the long-range strategy to reduce the amount of solid waste being generated, the department is developing an awareness program which will promote resource conservation and recycling efforts to the general public.

E. Career Potential

Increased management and planning activity at the state and local levels is expected to provide career opportunities for approximately nine professionals. On the private sector level there will be some demand for heavy equipment operators who are skilled in machinery usage, proper landfill practices, and correct handling of hazardous wastes. Highly trained engineers, geologists, and hydrologists may also find career opportunities in the management of hazardous wastes in such areas as site selection and design and development of disposal methods. Although resource recovery has not received much emphasis, if this field should develop in the future, highly trained engineers and scientists will be required for the planning, design and operation of resource recovery facilities. Training for personnel for the field of solid waste management may be accomplished through university programs, vocational/technical institutions and community colleges.

F. Conclusion

Although current program activities involve more stringent enforcement of existing regulations, the development of hazardous waste control guidelines and increased planning of landfill sites, upper level solid

waste management personnel have indicated that only through a strong promotional program aimed at changing the antiquated solid waste management habits of the general public can an acceptable long-range solid waste management system be developed.

While more stringent enforcement of regulations and development of hazardous waste control guidelines predominate management activity, the physical aspect of collection and disposal will provide the greatest number of job opportunities. The training of landfill operators will best be accomplished through EPA-sponsored short courses on-site or offered at easily accessible locations in seminar form as cost constraints continue to restrict rural municipal training efforts. Planning and implementation of the Resource Conservation and Recovery Act of 1976 (RCRA) will have a significant impact on the solid waste field. Particular areas of emphasis will include engineering, systems design, operations management and planning more sophisticated and complex methodologies for disposal of all wastes. Concordant with these activities, resource recovery and energy conversion activities will also influence job opportunities. Throughout the field more individuals will be needed with defined technical and academic skills in the sciences, management, and engineering disciplines.

VII. WASTE WATER

A. Introduction

The Idaho legislature, through the Environmental Protection and Health Act of 1972, declared it to be the "policy of the state to provide for the protection of the environment". The Director of the Department of Health and Welfare is charged with "the supervision and administration of a system to safeguard the quality of the waters (surface and underground) of this state, including, but not limited to the discharge of effluent into the waters of this State and the storage, handling and transportation of solids, liquids, and gases which may cause or contribute to water pollution". The Director is also charged with the authority to formulate and recommend to the Board of Health and Welfare, rules, regulations, codes and standards, as may be necessary to deal with problems related to water pollution; and the enforcement of all such laws, regulations, codes and standards.

The water quality program of the State of Idaho is administered by the Department of Health and Welfare pursuant to the above public policy and the powers and duties set forth in the Environmental Protection and Health Act of 1972. Specific program elements include the following:

1) Water Quality Management Planning - This program element involves the effective management and coordination of 208 areawide planning and basin planning activities.

2) Municipal Programs - The management of a construction grants program in conjunction with waste water treatment plant operator training predominates activities within this program area.

3) Permits, Compliance Assurance, and Enforcement - Major emphasis in this program area is placed on the development of effluent limitations, evaluations, and fact sheets. In addition, IDHW takes a strong role in making enforcement recommendations regarding NPDES permit discrepancies, although at this time EPA continues to maintain primary enforcement responsibility for this permit program.

4) Surveillance and Analysis - Compliance surveys, operation and maintenance surveys, and intensive water quality surveys are all essential elements of this program.

5) Non-Point Source Control - The development of a non-point source control program with cooperation and assistance from the U.S. Forest Service and the Department of Agriculture comprises program activity in this area.

B. Workforce Profile

Information for the workforce profile was obtained through on-site interviews with professionals from the IDHW, DOE, Bureau of Water Quality. Of particular assistance was Mr. Al Murrey, Chief, Bureau of Water Quality.

As the regulatory body for waste water pollution control, the Bureau of Water Quality conducts activities involving a professional workforce of 35 persons. These activities include compliance monitoring surveys, water quality assessments, treatment plant efficiency studies, waste water construction grants administration, and rules and regulation development.

The following table illustrates the distribution of personnel by profession.

TABLE XIV

IDAHO DEPARTMENT OF HEALTH AND WELFARE
Division of Environment
Bureau of Water Quality
Waste Water Pollution Control
Current (1976) Staffing Level

Position	1976
Engineer	17
Technician	3
Scientist	14
Other	1
TOTAL	35

Extensive job opportunities for treatment plant operators have been made possible over the past five years through construction of waste water treatment facilities. This workforce includes both certified and non-certified operators. As Idaho has not yet established a mandatory certification program, a voluntary certification program to promote the improvement and certify the ability of personnel employed in waste water facilities has been developed. Of the approximatly 450 persons currently involved in this workforce, combining both municipal and private efforts, an estimated 72 percent of the operators currently employed have been certified through the voluntary program. The following table provides a current waste water workforce profile for certified operators by certification level.

TABLE XV

Certified Waste Water Treatment Plant Operators
Current (1976) Staffing Level

Classification	1976
Certified Municipal Waste Water Operators	
Lagoon	47
Class I	82

TABLE XV - Continued

Classification	1976
Class II	41
Class III	19
Class IV	10
Laboratory	
IL	2
IIL	3
IIIL	2
	206
Water and Sewer District Waste Water Operators	7
Certified Industrial Waste Water Operators	19
Federal Facility Waste Water Operators	20
Other (out-of-state, labs, other facilities) Waste Water Operators	74
TOTAL	326

Note: "L" refers to lagoon.

C. Workforce Projections

The Bureau of Water Quality staff has indicated that a five-year growth in staff may involve 15 professional positions. These staff positions will be developed in response to the delegation of National Pollution Discharge Elimination System (NPDES) primacy responsibilities and more stringent enforcement of existing and forthcoming regulations. Table XVI illustrates the distribution of projected workforce personnel by discipline.

TABLE XVI

IDAHO DEPARTMENT OF HEALTH AND WELFARE

Division of Environment
Bureau of Water Quality
Waste Water Pollution Control
Workforce Projections to 1982 (est.)

Position	1976	1977	1978	1979	1980	1981	%/annum turnover (average)	%/annum growth (average)
Engineer	17	17	17	20	20	22	20%	6%
Technician	3	3	3	6	7	7	15%	23%
Scientist	14	14	14	17	19	20	15%	8%
Other	1	1	1	1	1	1	15%	0%
TOTAL	35	35	35	44	47	50		8%

As is evident in the preceding table, the workforce is projected to remain stable until 1978. Increases will begin in 1979, at which time acceptance of NPDES primacy is expected.

Private sector workforce projections are based on information obtained through interviews conducted with professionals at the IDHW, Department of Environment. Of particular assistance was Mr. Mike McMasters, Training and Certification. Workforce projections concerning waste water operators are based on the assumption that mandatory certification will be developed within two years. Table XVII provides these projections by classification level to 1982.

Certified operator growth rates may be misleading in that projected growth is based on certification of operators which does not identify currently employed, but not certified, personnel. Consequently, growth rates project certification activity as workforce growth.

As indicated in Table XVII, turnover rates are proportionate to certification levels. As personnel become certified at higher levels, they not only increase their salary, but attain a greater sense of professionalism which promotes job security.

D. Training and Certification

The operation of training programs designed to facilitate and promote operator certification predominates training activity in this area. Specific classification requirements for the various certification levels are as follows:

TABLE XVII

Certified Waste Water Treatment Plant Operators
Workforce Projections to 1982 (est.)

Classification	1976	1977	1978	1979	1980	1981	%/annum turnover (average)	%/annum growth (average)
Certified Municipal Waste Water Operators								
Lagoon	47	53	60	78	89	105	20%	18%
Class I	82	97	116	132	150	164	20%	15%
Class II	41	52	61	70	80	90	20%	17%
Class III	19	24	26	29	31	34	15%	12%
Class IV	10	11	13	14	15	16	10%	10%
Laboratory								
IL	2	2	3	3	4	4	10%	17%
IIL	3	3	4	4	5	6	10%	16%
IIIL	2	2	3	3	4	4	10%	17%
Certified Industrial Waste Water Operators	19	24	28	32	36	41	10%	17%
Water and Sewer District Waste Water Operators	7	9	11	13	15	16	10%	18%
Federal Facility Waste Water Operators	20	23	26	29	32	36	10%	12%
Other (out-of-state, labs, other facilities) Waste Water Operators	74	85	96	107	118	130	10%	12%
TOTAL	326	385	447	514	579	646		17%

Suggested Minimum Job Classifications for Waste Water Systems Operators

WASTE WATER SYSTEMS OPERATOR IV

Nature of Work: Responsible for and in charge of operation and maintenance of a Class IV waste water system (Idaho DHW classification) and for day-to-day performance to prevent pollution of receiving waters by waste water effluents. Manages a relatively large organization. Business control. Policy determination. Financial and improvements planing. Public relations. Exercises judgement and initiative on a high level of responsibility.

Examples of Work: General supervision of plants and systems. Plan and recommend policies and budgets. Planning for expansion and improvements at plant and on system. General supervision of personnel. General supervision of reports, records, accounts, billing, requisitions, etc. Sponsors research and development: Reviews operating performance data and chemical, physical and bacteriological analyses. General supervision of training and safety programs. Contact with public officials. Public speaking. Policy-level conferences. Discipline of personnel.

Essential Knowledge, Abilities, and Skills: Knowledge of (1) management practices; (2) budgeting; (3) municipal laws and regulations; (4) technical operation of waste water plants and collection systems: (5) utility economics, service charges and rates; (6) financing needs and limitations; (7) basic sanitary engineering and public health standards. Ability to (1) investigate, plan and carry out improvement programs: (2) confer knowledgeably with technical operators on plant and system problems and needs; (3) organize and supervise activities of subordinate personnel effectively; (4) effect business controls and economics related to performance; (5) stimulate enthusiasm of personnel; (6) write and speak persuasively; (7) develop and carry out public relations programs.

Qualifications: College degree in science or engineering or equivalent training credits to meet college requirement. Broad experience in engineering and management. Competency to work successfully within the governmental framework. Management ability.

Desirable Experience and Training: Registered professional engineer. Masters degree in sanitary engineering. Research and development. Financial planning, rate structures, cost estimating, and operating costs related to performance. Business systems and procedures. Municipal and utility law and regulations.

Certification Requirements: Possession of a Class IV Waste Water Systems operators certificate from the Idaho Waste Water Operators Certification Program.

Waste Water Systems Operators III

Nature of Work: Responsible for and in charge of operation and maintenance of a Class III Waste Water System (Idaho DHW classification) and for day-to-day performance to prevent pollution of receiving waters by waste water effluents. Maintains a constant check on the performance of plant and collection systems. Supervises work of subordinate employees. Performs related work as required. Exercises judgement and initiative.

Examples of Work: Plans, schedules, and assigns work of subordinate operators, maintenance laborers, clerks, and laborers. Supervises operation and maintenance of waste water plant and collection systems. Instructs operators in operating methods and procedures. Plans and carries out maintenance of all kinds. Finds and corrects operating troubles; supervises repairs. Orders supplies, spare parts, chemicals. Determines rate of flow for treatment and adjusts facilities for effective removals. Keeps necessary records. Makes special reports. Promotes improvements. Budget preparation.

Essential Knowledge, Abilities and Skills: Knowledge of (1) equipment, instruments, materials and operating practices for waste water treatment plants and collection systems; (2) occupational hazards and safety precautions; (3) waste water chemistry, hydraulics, bacteriology, and laboratory techniques; (4) public health needs; (5) practices, methods, materials, and tools of mechanical trades; (6) methods of training and instructing employees. Ability to (1) analyze complex maintenance and repair needs; (2) supervise maintenance and repairs in plant and on system; (3) plan, layout, and inspect work of personnel; (4) establish and maintain systems of cost accounting, bookkeeping, stockkeeping, and recordkeeping; and (5) supervise and handle personnel effectively. Skill in communication and public relations.

Qualifications: High school graduation and 2-year AA degree or its equivalent. Knowledge and training in basic sciences. Broad experience in plant operation and maintenance. Special courses in waste water chemistry, electricity, bacteriology, laboratory techniques.

Desirable Experience and Training: College degree in science or engineering. Advanced training in chemistry, physics, bacteriology, engineering sciences. Research and development methods and procedures. Business training, economics, and cost related to performance. Speaking and writing of English. Personnel handling. Management and public relations.

Certification Requirements: Possession of a Class III (or higher) Waste Water Systems operator's certificate from the Idaho Waste Water Operators Certification Program.

Waste Water Systems Operator II

Nature of Work: Responsible for and in charge of operation and maintenance of a Class II Waste Water system (Idaho DHW classification) and for day-to-day performance to prevent pollution of receiving waters by waste water effluents. Maintains a constant check on performance of plants and collection systems. Supervises work of subordinate employees and laborers. Performs related work as required. Exercises judgement and initiative.

Examples of Work: Operates and checks equipment, instruments, pumps, valves, meters, and other apparatus. Observes condition of waste water and makes adjustments of equipment for effective treatment. Checks delivery of pumps and overflows and bypasses. Makes daily inspection of mechanical and electrical operating condition of equipment, and records findings. Supervises general maintenance. Takes samples of raw and treated waste waters and of receiving waters above and below plant, analyzes them and records the results. Keeps a log of plant and system operations. Calculates operating performance and operation costs. Keeps records and makes reports. Directs and supervises subordinates and laborers. Plans and schedules work and assignments. Budget preparation.

Qualifications: High school graduation or equivalent. Knowledgeable in sciences and mathematics. Good mechanical aptitude. Experience in mechanical and electrical equipment operation and maintenance. Knowledge of waste water chemistry, hydraulics and bacteriology.

Desirable Experience and Training: Operating and maintaining waste water treatment and pumping equipment. Courses in electricity, waste water chemistry, hydraulics, physics, etc.

Certification Requirements: Possession of a Class II (or higher) Waste Water Systems operator's certificate from the Idaho Waste Water Operators Certification Program.

Waste Water Systems Operator I

Nature of Work: Responsible for and in charge of a Class I waste water system (Idaho DHW classification) and for day-to-day performance to prevent pollution of receiving waters by waste water effluents. Maintains a constant check on performance of plants and collection systems. Supervises work of subordinate employees and laborers. Exercises judgement and initiative. Performs related work as required.

Examples of Work: Operates and checks equipment, instruments, pumps, valves, etc. Takes readings of pressures, volumes, weights, levels and other data, and records it on the log sheet. Lubricates, cleans and adjusts equipment. Keeps records of all phases of operation and maintenance

Collects samples of raw and treated waste waters and of receiving stream above and below plants, and makes sanitary analyses of samples. Interprets laboratory results. Directs and supervises laborers. Plans and schedules work assignments.

Essential Knowledge, Abilities and Skills: Knowledge of operation, maintenance and repair of mechanical and electrical equipment. Ability to (1) check and detect flaws and defects in operation of equipment; (2) make minor repairs to equipment; (3) use hand tools; (4) keep neat records and reports; (5) make routine laboratory tests; (6) give clear and understandable instructions. Good physical condition.

Qualifications: High school or its equivalent. Interest and aptitude in sciences and mathematics. Ability to do simple arithmetic. Mechanical aptitude.

Desirable Experience and Training: Experience in operating and maintaining mechanical and electrical equipment, particularly at a waste water system. Supplemental courses in chemistry. Vocational school courses.

Certification Requirements: Possession of a Class I (or higher) waste water systems operator's certificate from the Idaho Waste Water Operators Certification Program.

Waste Water Systems Operator L (Lagoon)

Nature of Work: Responsible for maintenance of lift stations, lagoon structures and banks, and performs related work as required. Does required sampling and laboratory analyses to assure compliance with water pollution abatement requirements.

Examples of Work: Mows and sprays lagoon banks to control weeds; maintains lift pumps and/or aerators as appropriate. Samples lagoon effluent for bacteriological and biochemical oxygen demand evaluations. Keeps records of expenses and laboratory determinations. Reports to city health department officials as required.

Essential Knowledge: Basic understanding of sewage treatment by lagoon process and water quality requirements.

Qualifications: High school graduation or equivalent, interest and aptitude in mechanics and simple laboratory procedures.

Desirable Experience and Training: Report keeping and simple laboratory analyses.

Certification Requirements: Possession of a Class L (or higher) certificate from the Idaho Waste Water Operators Certification Program.

The training and certification needs of waste water personnel are coordinated through Mr. Mike McMasters of IDHW, Division of Environment.

According to a recent study done by the Association of Boards of Certification for Operating Personnel in Water and Wastewater Utilities entitled Roles and Responsibilities for Developing a Comprehensive State Water and Wastewater Operator Training Program, in 1976, 114 operators in Idaho obtained training through opportunities made available by the Bureau of Water Quality. These training activities were offered through community colleges in the form of preparatory courses and in seminars and correspondence courses developed through Sacramento State University.

E. Career Potential

In view of the expected increases at the state level, professional persons having degrees in engineering, hydrology, and chemistry can expect job opportunities to develop in response to acceptance of primacy for NPDES responsibilities.

Job opportunities will be substantial in the area for plant operators because of continued construction of new facilities and the modification of existing treatment facilities. Occupational upward mobility has been made available through the existing voluntary certification program which has provided a greater sense of professionalism to the operators in the field.

F. Conclusion

In summarizing the waste water pollution control situation, the major workforce need is expected to be generated at the treatment facilities level.

It is obvious that more stringent enforcement of existing legislation and technological advances in the field of waste water treatment are going to create many jobs for treatment plant personnel in the next five years. These positions will include plant operators, maintenance personnel, and a basic labor force. It has been suggested by sources in the field that the proper training and certification of operator personnel may increase efficiency of a treatment plant by 50%. This would indicate that operator training in the future will become an important component in the effort to eliminate waste water pollution in Idaho.

VIII. ENERGY

A. Introduction

The Idaho State Office of Energy was established by Executive Order of the Governor on November 1, 1973. The purpose of this office is to administer the Federal mandatory petroleum products allocation program; to review the policy of departments of state governments that affect the production, distribution and consumption of energy and energy producing fuels; and, to maintain liaison with the federal and other state governments in order to keep state policy consistent with national policy relative to production, distribution and consumption of energy and energy-producing fuels.

The office is funded by grants from the Pacific Northwest Regional Commission and the Federal Energy Administration (FEA).

There are three principal operating sections of the Office of Energy. They are:

1) The Energy Management Section. The primary functions of this section are the development of media information concerning energy conservation programs and the coordination of Energy Research and Development activities.

2) The Geothermal Section. This section is currently involved with the development of a geothermal heating project. This demonstration project has been made possible through a research grant to Boise State University by the Energy Research and Development Administration.

3) The Energy Conservation Section. This section is responsible for the development of a state energy conservation plan. For the most part, funding for this section comes from FEA.

The major programs within this office involve the following:

1) Information Systems: identification of the gasoline distribution network in Idaho from supplier to retailer, including pipelines, terminals and bulk plants; continuous updating of the distribution network provides a base for supply and demand projections.

2) Natural Gas: survey of approximately 300 industrial natural gas users provides a knowledge of standby energy systems used when curtailment occurs.

3) Allocation System: regulates and disperses fuel for emergency cases.

4) Conservation: program for residential, commercial, industrial, agricultural, transportation and government sectors.

B. Workforce Profile

The Idaho State Office of Energy is currently staffed by nine professionals in positions of research analysts, public relations specialists, and scientists. The breakdown among these positions is shown in Table XVIII.

TABLE XVIII

IDAHO STATE OFFICE OF ENERGY
Current (1976) Staffing Level

Position	1976
Research Analyst	3
Public Relations Specialist	3
Scientist	3
TOTAL	9

The personnel listed in the category "Scientist" include one geothermal specialist, one physics/mathematics specialist, and one master's level education specialist.

C. Workforce Projections

The Idaho Office of Energy is extremely dependent upon federal funding. Sources in the field have indicated that if funding becomes available through the Federal Energy Administration, projects involving state conservation plan implementation and statewide auditing of industrial power consumption levels are expected to require the addition of five professional staff members. These positions will include two engineers and three field research specialists.

Future energy production activity can be summarized in Tables XIX and XX. Locations are in Figure 1.

D. Training and Certification

At the present time, no formalized training programs are operational in the Office of Energy. However, development of a public-oriented education program is being carried on in the office and is expected to be operational within five years.

E. Career Potential

Career opportunities are expected to develop in this area for highly trained engineers, scientists, and architects. Vocational/technical personnel may find job opportunities in the areas of resource conversion, recycling, and conservation.

TABLE XIX

Future Electric Power Plants in Idaho

Plant name and location	Operating company	Planned fuel, million tons per year for coal	Planned capacity		Initial operating date		Peak employment			Remarks
			Unit no.	Mega-watts	Unit no.	Month & Year	Unit no.	Construction	Operation	
Brownlee Plant, Snake River, Washington County	Idaho Power Co., Boise, ID	Hydropower		225		April, 1979		150	0	Additional unit to hydroplant. FPC permit issued.
American Falls Plant, Snake River, Power County	Idaho Power Co. Boise, ID	Hydropower		93		April, 1978		680	10	Rebuilding of existing hydroplant facilities. FPC permit issued. Idaho courts reviewing financing.
Pioneer Nos. 1 & 2, Orchard, Ada County	Idaho Power Co. Boise, ID	Coal-3.2 (total, both units)	1 2	500 500	1 2	April 1981 April 1983	1 2	500 500	75 75	Idaho P.U.C. has yet to approve. No permits have been issued.

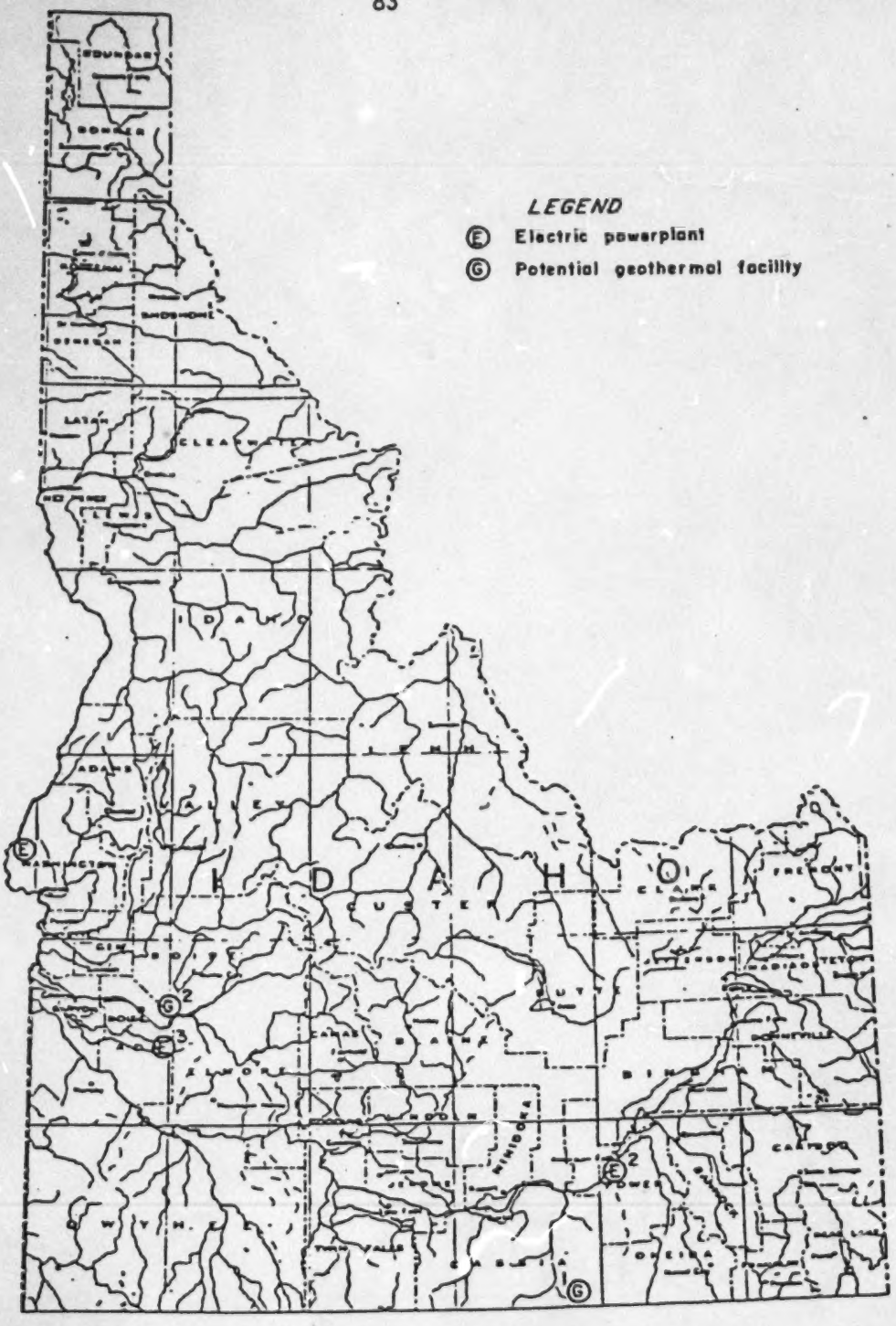


Figure 6
Future Fuels-Related Projects in Idaho

F. Conclusion

Although this area of activity is extremely dependent upon federal support at this time, all indications point to growth in energy-related fields. Highly trained specialists in engineering, the sciences, and architecture will be needed for the development and implementation of energy conversion and conservation plans.

Idaho currently is implementing plans for future electric power-plants which will provide a great number of jobs during construction and also a number of jobs during actual operation. Geothermal energy, however, seems to be the greatest potential alternative energy form at the present time, with research being conducted at two locations in Idaho. If this becomes an energy fuel reality in the future, highly trained specialists will be needed to develop and maintain pollution control systems specifically designed to control the particular pollutants inherent in geothermal production.

Along with research of alternative energy forms, public education of energy conservation is necessary. If the public awareness program is expected to effectively reduce public consumption of energy resources, the development of an intensive information system may well be the primary mode of accomplishing this.

Selected Post Secondary Institutions With Formal Environmental Energy Programs

While there are a limited number of post-secondary educational institutions in the State of Idaho, nearly all the colleges and universities have or are planning to offer courses or programs with an environmental emphasis. Three of the state's colleges offer a Bachelor's degree in some aspect of environmental science.

The College of Idaho, located in Caldwell, Idaho, awards a Bachelor's degree in Human Ecology. The degree must be taken as a "second major". The College highly recommends that the first major be taken in one of the basic science disciplines, e.g., biology, botany, chemistry. The Human Ecology degree program, which was implemented in 1970, requires a minimum of thirty-two semester hours of course work; however, each student, in coordination with a faculty advisory committee, designs a program of individual study that conforms to the student's personal educational objectives.

Boise State University offers an undergraduate program in Environmental Health. While the program provides the student with an extensive technical background in general sciences, it also introduces the student to overall environmental health administrative and legislative techniques. This program of study was likewise implemented in 1970.

The third state college offering an environmental science emphasis is Lewis and Clark State College. A Bachelor of Science degree in Social Science with an option in Environmental Science is awarded through the college.

Other colleges offering individual courses are Idaho State University, College of Southern Idaho, North Idaho College, and Ricks College.

While Idaho State University offers two environmental courses, Environmental Technology and Environmental Health, a degree program is also available in Conservation. The College of Southern Idaho has one available environmental course, Man and Environment. Ricks College, a two-year college, has a select course in both Ecology and Field Ecology. The North Idaho College has a program in Social Ecology Resource Conservation.

All colleges and universities interviewed stressed their concern for a heightened environmental awareness. Most institutions indicated that they were striving to accomplish this goal through integrating related environmental materials and theory into existing program curricula.

Two college programs will be reviewed in detail in the following section of this report. The two programs chosen for review are Boise State University and College of Idaho. The basic aspects of the programs being reviewed are hours required for a major, staff size, program inception, student information, and available courses.

SENIOR INSTITUTIONS

Boise State University
Boise, Idaho

Program: Environmental Health (B.S.)

Hours required for major: Semester - 128
Program Inception: 1970
Staff Size: Two instructors (1 Ph.D., 1 M.S.) with support from eight lecturers
Enrollment: 16
Graduates (1976): 3
Placement: 3
Graduate Work: 0

Courses

English Composition
College Chemistry
Man and His Environment
Botany
Zoology
Elementary Organic Chemistry
Psychology
General Bacteriology
Pathogenic Bacteriology
Entomology
General Physics
Environmental Management
Food Microbiology
Public Health Administration
Environmental Health Legislation
Bioecology
Public Health Field Training

SENIOR INSTITUTIONS

College of Idaho
Caldwell, Idaho

Program: Human Ecology (B.S., must be taken as a second major)

Hours required for major: Semester - 32
Program Inception: 1970
Staff Size: not available due to the interdisciplinary nature of the program
Enrollment: not currently available
Graduates (1976): 5
Placement: 1
Graduate Work (M.S.): 3

Courses

All courses are designed for the individually prescribed desires of each student. Students register under the following designations: Introductory Seminar, Junior Seminar, and Senior Seminar.

State Legislation

IDAHO GENERAL

TITLE:

Environmental Protection and Health Act of 1972
Idaho Code 39-101

PURPOSE:

To provide for the protection of the environment and the promotion of personal health and safety of the people of the state.

DEFINITIONS:

1. Board
2. Department
3. Director
4. State
5. Air contaminant
6. Air pollution
7. Emission
8. Water pollution
9. Waters
10. Solid waste
11. Solid waste disposal
12. Laboratory
13. Person
14. Public swimming pool
15. Public water supply

ADMINISTERING AUTHORITY:

Board of Health and Welfare
Department of Health and Welfare

AUTHORIZATIONS:

To assume all duties of the Department of Health, the Board of Health, and the Air Pollution Control Commission;
To issue regulations relating to air, water, visual, noise and solid waste pollution;
To administer all permit programs under regulations;
To supervise and control air and water quality;

AUTHORIZATIONS (Cont'd):

To provide technical assistance to local governmental units;
To act as the state lead agency in water pollution matters;
To undertake investigations and enforce the act;
To issue pollution source permits for air and water matters;
To review all public water, sewage system and waste water treatment plans prior to construction.

PROHIBITED ACTS:

To fail to obtain any required permit or to violate the terms of any permit;
To violate any order or regulation issued under the act.

PENALTIES:

Criminal - fines of up to $300;
Civil - fines of up to $1,000 per day; liability also imposed for terminating any environmental damage caused.

TABLE XX

Potential Geothermal Facilities in Idaho

Location	Company	Current Status, Plans and other Relevant Information
Raft River Valley, near Bridge, Cassis County	ERDA research grant to Aerojet Nuclear Co., Idaho Falls, ID	Project plans call for the design and development of a 10 kw pilot plant utilizing approximately 300°F hot water as a source for generating electricity. USGS has completed 2 wells and the third is in progress. It is expected that 7 wells will be needed to obtain the required flow of water, based on flow and temperature at existing wells.
Boise Front, Boise, ID	ERDA research grant to Boise State University, Boise, ID	For the past 70 years, warm springs in the Boise Front have supplied space heating for 200 homes and the old State Penitentiary in Boise. Under the research grant, University geologists are supervising a drilling program in an attempt to develop enough hot water (about 170°) to supply space heating for the university and state buildings in the capitol complex. Results, although inconclusive, are encouraging and the project is expected to continue.

IDAHO PESTICIDES

TITLE:

Pesticide Use and Application Law
Idaho Code 22-2208

PURPOSE:

To provide for a program of pesticide applicator certification and general pesticide control.

DEFINITIONS:

1. Aircraft
2. Apparatus
3. Commissioner
4. Custom application of pesticides
5. Defoliant
6. Desiccant
7. Fungi
8. Fungicide
9. Ground equipment
10. Herbicide
11. Insect
12. Insecticide
13. Person
14. Pest
15. Pesticide
16. Pesticide applicator
17. Pesticide dealer
18. Pesticide operator
19. Plant regulator
20. Public hearing
21. Restricted use pesticide
22. Weed

ADMINISTERING AUTHORITY:

Department of Agriculture

AUTHORIZATIONS:

To issue regulations and enforce the act;
To classify pesticides and restrict their usage;
To enter and inspect property in enforcement of the act;
To regulate storage, disposal and labeling of pesticides;

AUTHORIZATIONS (Cont'd):

To license pesticide dealers;
To establish certification standards;
To categorize commercial applicators;
To certify private and commercial applicators.

CERTIFICATION OR LICENSING:

Private and commercial applicators must be certified; examination may be required; nine categories of commercial applicators established.

PROHIBITED ACTS:

To engage in custom application of pesticides without license;
To use restricted use pesticides without proper certification;
To fail to comply with storage, labeling and other requirements;
To violate any other act provision.

EXEMPTIONS:

Farmers, government research, ornamental and lawn pesticide use.

PENALTIES:

Commercial applicator violations - fines of up to $50 per day;
General violations - violation constitutes a misdemeanor.

IDAHO SOLID WASTE

TITLE:

Solid Waste Disposal Sites Law
Idaho Code 31-4401

PURPOSE:

To reduce the threat to the environment through establishment of local solid waste disposal sites.

DEFINITIONS:

1. System

ADMINISTERING AUTHORITY:

County Boards of Commissioners

AUTHORIZATIONS:

To acquire, establish and operate county solid waste disposal systems;
To levy assessments to fund solid waste operations;
To adopt regulating ordinances.

PROHIBITED ACTS:

To violate any provisions of the act;
To dispose of solid waste except at an established disposal system.

PENALTIES:

Violation constitutes a misdemeanor;
Liability imposed for actual damage caused and for cleanup expenses.